DEPARTMENT OF TRANSPORTATION

Federal Railroad Administration

49 CFR Parts 229, 231, and 232

[FRA Docket No. PB–9; Notice No. 13]

RIN 2130—AB16

Brake System Safety Standards for Freight and Other Non-Passenger Trains and Equipment

AGENCY: Federal Railroad Administration (FRA), DOT.

ACTION: Notice of proposed rulemaking (NPRM).

SUMMARY: FRA proposes revisions to the regulations governing the power braking systems and equipment used in freight and other non-passenger railroad train operations. The proposed revisions are designed to achieve safety by better adapting the regulations to the needs of contemporary railroad operations and facilitating the use of advanced technologies. These proposed revisions are being issued in order to comply with Federal legislation, to respond to petitions for rulemaking, and to address areas of concern derived from experience in the application of existing standards governing these operations.

DATES: (1) Written Comments: Written comments must be received by January 15, 1999. Comments received after that date will be considered to the extent possible without incurring additional expenses or delay.

(2) Public Hearings: FRA is planning to conduct at least two public hearings with the first public hearing being held in Washington D.C. and one technical conference with interested parties in order to provide all interested parties the opportunity to comment on the proposed revisions contained in the NPRM. FRA will issue a separate document in the **Federal Register** in the very near future to inform all interested parties as to the exact dates and locations where the public hearings and technical conference will be held.

ADDRESSES: (1) *Written Comments:* Address comments to the Docket Clerk, Office of Chief Counsel, RCC–10, Federal Railroad Administration, 400 Seventh Street, S.W., Stop 10, Washington, D.C. 20590. Comments should identify the docket and notice number, and five copies should be submitted. Persons wishing to receive confirmation of receipt of their comments should include a self-addressed, stamped postcard. The Docket Clerk will indicate on the postcard the date on which the comments were received and will return the card to the addressee. The dockets are housed in the Seventh Floor of 1120 Vermont Avenue, N.W., Washington D.C. Public dockets may be reviewed between the hours of 8:30 a.m. and 5:00 p.m., Monday through Friday, except holidays.

(2) *Public Hearings:* FRA is planning to conduct at least two public hearings with the first public hearing being held in Washington D.C. and one technical conference with interested parties in order to provide all interested parties the opportunity to comment on the proposed revisions contained in the NPRM. FRA will issue a separate document in the **Federal Register** in the very near future to inform all interested parties as to the exact dates and locations where the public hearings and technical conference will be held.

FOR FURTHER INFORMATION CONTACT: Leon Smith, Deputy Regional Administrator—Region 3, FRA Office of Safety, RRS–14, 400 Seventh Street, S.W., Stop 25, Washington, D.C. 20950 (telephone 404–562–3800), or Thomas Herrmann, Trial Attorney, Office of the Chief Counsel, RCC–10, 400 Seventh Street, S.W., Stop 10, Washington, D.C. 20950 (telephone 202–493–6053).

SUPPLEMENTARY INFORMATION:

Background

In 1992, Congress amended the Federal rail safety laws by adding certain statutory mandates related to power brake safety. *See* 49 U.S.C. 20141. These amendments specifically address the revision of the power brake regulations by adding a new subsection which states:

> (r) POWER BRAKE SAFETY.—(1) The Secretary shall conduct a review of the Department of Transportation's rules with respect to railroad power brakes, and not later than December 31, 1993, shall revise such rules based on such safety data as may be presented during that review.
>
> (2) In carrying out paragraph (1), the Secretary shall, where applicable, prescribe standards regarding dynamic brake equipment. * * *

Pub. L. No. 102–365, § 7; codified at 49 U.S.C. 20141, superseding 45 U.S.C. 431(r).

In response to the statutory mandate, the various recommendations and petitions for rulemaking, and due to its own determination that the power brake regulations were in need of revision, FRA published an Advance Notice of Proposed Rulemaking (ANPRM) on December 31, 1992 (57 FR 62546), and conducted a series of public workshops in early 1993. The ANPRM provided background information and presented questions on various subjects including: the use and design of end-of-train (EOT) telemetry devices; the air flow method of train brake testing; the additional testing of train air brakes during extremely cold weather; the training of employees to perform train brake tests and inspections; computer-assisted braking systems; the operation of dynamic brakes on locomotives; and other miscellaneous subjects relating to conventional brake systems as well as information regarding high speed passenger train brakes. The questions presented in the ANPRM on the various topics were intended as fact-finding tools and were intended to elicit the views of those persons outside FRA charged with ensuring compliance with the power brake regulations on a day-to-day basis.

Based on the comments and information received, FRA published a Notice of Proposed Rulemaking (1994 NPRM) regarding revisions to the power brake regulation. *See* 59 FR 47676 (September 16, 1994). In the 1994 NPRM, FRA proposed a comprehensive revision of the power brake regulations which attempted to preserve the useful elements of the current regulatory system in the framework of an entirely new document. FRA attempted to delineate the requirements for conventional freight braking systems from the more diverse systems for various categories of passenger service. In developing the NPRM, FRA engaged in a systems approach to the power brake regulations. FRA considered all aspects of a railroad operation and the effects that the entire operation had on the train and locomotive power braking systems. Therefore, the proposed requirements not only addressed specific brake equipment and inspection requirements, but also attempted to encompass other aspects of a railroad's operation which directly affect the quality and performance of the braking system, such as: personnel qualifications; maintenance requirements; written procedures governing operation, maintenance, and inspection; record keeping requirements; and the development and integration of new technologies.

Following publication of the 1994 NPRM in the **Federal Register**, FRA held a series of public hearings in 1994 to allow interested parties the opportunity to comment on specific issues addressed in the NPRM. Public hearings were held in Chicago, Illinois on November 1–2; in Newark, New Jersey on November 4; in Sacramento, California on November 9; and in Washington, D.C. on December 13–14, 1994. These hearings were attended by numerous railroads, organizations representing railroads, labor

organizations, rail shippers, and State governmental agencies. Due to the strong objections raised by a large number of commenters at these public hearings, FRA announced by notice published on January 17, 1995 that it would defer action on the NPRM and permit the submission of additional comments prior to making a determination as to how it would proceed in this matter. *See* 60 FR 3375. Although the comment period officially closed April 1, 1995, FRA continued to receive comments on the NPRM as well as other suggested alternatives well into October 1995.

Furthermore, beginning in mid-1995, FRA internally committed to the process of establishing the Rail Safety Advisory Committee (RSAC). The determination to develop the RSAC was based on FRA's belief that the continued use of *ad hoc* collaborative procedures for appropriate rulemakings was not the most effective means of accomplishing its goal of a more consensual regulatory program. FRA believed that the establishment of an advisory committee to address railroad safety issues would provide the best opportunity for creating a consensual regulatory program to benefit the Administrator in the conduct of her statutory responsibilities. FRA envisioned that the RSAC would allow representatives from management, labor, FRA and other interested parties to cooperatively address safety problems by identifying the best solutions based on agreed-upon facts, and, where regulation appears necessary, identify regulatory options to implement these solutions. The process of establishing the RSAC was not complete until March 1, 1996, and on March 11, 1996, FRA published a notice in the **Federal Register** that the Committee had been established. *See* 61 FR 9740.

In the interim, based on these considerations and after review of all the comments submitted, FRA published a notice in the **Federal Register** on February 21, 1996, stating that in order to limit the number of issues to be examined and developed in any one proceeding FRA would proceed with the revision of the power brake regulations via three separate processes. *See* 61 FR 6611. In light of the testimony and comments received on the 1994 NPRM, emphasizing the differences between passenger and freight operations and the brake equipment utilized by the two, FRA decided to separate passenger equipment power brake standards from freight equipment power brake standards. As passenger equipment power brake standards are a logical subset of passenger equipment safety standards, it was determined that the passenger equipment safety standards working group would assist FRA in developing a second NPRM covering passenger equipment power brake standards. *See* 49 U.S.C. 20133(c). In addition, in the interest of public safety and due to statutory as well as internal commitments, FRA determined that it would separate the issues related to two-way EOTs from both the passenger and freight issues, address them in a public regulatory conference, and issue a final rule on the subject as soon as practicable. A final rule on two-way EOTs was issued on December 27, 1996. *See* 62 FR 278 (January 2, 1997). Furthermore, it was announced that a second NPRM covering freight equipment power brake standards would be developed with the assistance of RSAC. At the Committee's inaugural meeting on April 1–2, 1996, the RSAC officially accepted the task of assisting FRA in development of revisions to the regulations governing power brake systems for freight equipment. *See* 61 FR 29164.

Members of RSAC nominated individuals to be members of the Freight Power Brake Working Group (Working Group) tasked with making recommendations regarding revision of the power regulations applicable to freight operations. The Working Group was comprised of thirty-one voting members as well as a number of alternates and technical support personnel. The following organizations were represented by a voting member and/or an alternate on the Working Group:

Association of American Railroads (AAR)
American Short Line Railroad Association (ASLRA)
Brotherhood of Locomotive Engineers (BLE)
Burlington Northern Santa Fe Railroad (BNSF)
Canadian National Railroads (CN)
Canadian Pacific Rail Systems (CP)
Consolidated Rail Corporation (CR)
CSX Transportation (CSX)
Illinois Central Railroad (IC)
International Association of Machinists & Aerospace Workers (IAMAW)
National Transportation Safety Board (NTSB)(Advisor)
National Association of Regulatory Commissioners (NARUC)/California Public Utilities Commission (CAPUC)
Norfolk Southern Corporation (NS)
Railway Progress Institute (RPI)
Sheet Metal Workers International Association (SMWIA)
Southern Pacific Lines (SP)
Transportation Communications International Union/Brotherhood of Railway Carmen (TCU/BRC)
Transport Workers Union of America (TWU)
Union Pacific Railroad (UP)
United Transportation Union (UTU)

The Working Group held seven multi-day sessions in which all members of the working group were invited. These sessions were held on the following dates:

May 15–17, 1996 in Washington D.C.;
June 11–13, 1996 in Chicago, Illinois;
July 31, 1996 in Chicago, Illinois;
August 21–23, 1996 in Annapolis, Maryland;
September 26–27, 1996 in Washington D.C.;
October 29–30, 1996 in Washington D.C.; and
December 4, 1996 in St. Louis, Missouri.

General minutes of each of these meetings are contained in FRA Docket PB–9 and are available for public inspection during the times and at the location noted previously. In addition to these meetings, there were numerous meetings conducted by smaller task force groups designated by the Working Group to further develop various issues. All of these smaller task forces were made up of various members of the Working Group or their representatives, with each task force being represented by management, labor, FRA and other interested parties. The Working Group designated smaller task forces to address the following issues: dry air; dynamic brakes; periodic maintenance and testing; electronically controlled locomotive brakes; and inspection and testing requirements. These task forces were assigned the job of developing the issues related to the broad topics, presenting reports to the larger Working Group, and if possible making recommendations to the Working Group for addressing the issues (recommendations and reports of these task groups will be addressed in detail in the Discussion of Issues portion of the preamble to follow).

Although the Working Group discussed, debated, and attempted to reach consensus on various issues related to freight power brakes, consensus could not be reached. However, the working group in conjunction with the various task forces developed a wealth of information on various issues and further clarified the parties' positions regarding how the issues could or should be addressed in any regulation. The major cluster of issues, upon which resolution of many of the other issues rested, were the requirements related to the inspection and testing of brake equipment. The inspection and testing task force met on numerous occasions, gathered and

reviewed data, and the labor and rail management representatives to the task force drafted various proposals and options related to the inspection and testing of freight brake equipment (these proposals are addressed in detail in the Discussion of Issues portion of the preamble to follow). Members of the inspection and testing task force presented their proposals to the larger Working Group as well as the underlying bases for the proposals. The Working Group discussed the proposals and investigated many of the costs and benefits related to the various proposals as well as the safety implications; however, the Working Group could not reach any type of consensus position. Consequently, FRA declared that an impasse had been reached and announced, at the December 4, 1996 meeting of the Working Group, that FRA would proceed unilaterally with the drafting of the NPRM.

Subsequent to December 4, 1996, several members of the Working Group, including representatives from both rail management and labor, continued informal discussions of some of the issues related to the inspection and testing of freight equipment. These representatives informed FRA that a consensus proposal might be possible provided that the Working Group were permitted to continue deliberations. Consequently, FRA agreed to reconvene the Working Group and in April 1997 three additional meetings were conducted on the following dates:

April 2–3, 1997 in Kansas City, Missouri;
April 10–11, 1997 in Phoenix, Arizona; and
April 23 in Jacksonville, Florida.

Representatives of both rail management and rail labor presented the Working Group with inspection and testing proposals for consideration and review both before and during this period. Although the proposals were discussed and deliberated, the Working Group was once again unsuccessful in reaching consensus on any of the freight power brake inspection and testing issues. Consequently, by letter dated May 29, 1997, FRA informed the members of the Working Group that FRA would be withdrawing the freight power brake task from the Working Group at the next full RSAC meeting on June 24, 1997. FRA provided this notice to avoid any misunderstanding regarding the process by which the proposed rule would be drafted. FRA also informed the members of the Working Group that it would not invest further time in attempting to reach consensus unless all other members of the Working Group jointly indicated that they have reached consensus on a proposal and wanted to discuss it with FRA. FRA noted that if that were to occur prior to June 24, 1997, it would reconsider withdrawing the task from RSAC. As no consensus proposal was presented to FRA prior to June 24, 1997, FRA withdrew the task from the Working Group and informed the members of RSAC that FRA would proceed unilaterally in the drafting of a freight power brake NPRM.

Although FRA proceeded on its own in drafting this document, FRA believes that all members of the Freight Power Brake Working Group should be commended for their hard work and dedication in attempting to resolve and address some of the most difficult and complex issues with which FRA deals. FRA believes that the information and knowledge provided by these individuals has helped FRA draft a proposal that not only ensures the continued safety of railroad employees and the public, but also recognizes the needs of contemporary railroad operations.

FRA has carefully considered the information, data, and proposals developed by the Freight Power Brake Working Group as well as all the oral and written comments offered by various parties regarding the 1994 NPRM on power brakes. The resulting NPRM is based on this information as well as FRA's experience with enforcing the current power brake regulations.

Prologue

FRA's institutional experience in locomotive and train braking safety extends backwards in time to the creation of the Department of Transportation in 1967 (at which time the Bureau of Railroad Safety and its functions were transferred from the Interstate Commerce Commission), to the passage of the Power or Train Brakes Safety Appliance Act of 1958, and ultimately to the passage of the original Safety Appliance Act over 100 years ago. Current FRA personnel have, during prior years, served in a variety of capacities on every major railroad. These railroad safety inspectors, supervisors, and managers contribute daily to the rulemaking judgments ultimately expressed by the Federal Railroad Administrator, and the agency has made a special effort in this proceeding to tap the knowledge that these individuals possess to ascertain the means by which public and employee safety may be secured.

As evidenced by the preceding discussion, FRA has spent years attempting to develop new power brake regulations to ensure the safety of our nation's railroads while recognizing the wide variety of railroad operations and technologies that currently exist in the industry. In the 1994 NPRM, FRA proposed a comprehensive and innovative revision to the power brake regulations. At that time, FRA was attempting to develop a set of regulations that addressed freight, passenger, and tourist operations, and thus, required FRA to provide certain latitudes and restrictions that were not completely compatible with every type of operation covered by the proposal. Consequently, many segments of the industry adamantly objected to the proposal. FRA believes that many of these objections were due, at least in part, to the complexity of the proposal as well as to a misunderstanding of exactly what was being proposed.

Since that time, as noted above, FRA has instituted rulemakings to address passenger and commuter operations and equipment, two-way end-of-train devices, and has developed a channel of communication to address tourist and excursion operational concerns. The current proposal is focused solely on freight and other non-passenger operations. Furthermore, FRA is limiting this proposal to the operation, inspection, and maintenance of freight power brake systems. Thus, unlike the previous proposal, FRA will not, for the most part, attempt to include provisions related to the inspection and maintenance of locomotive braking systems or to the performance of other mechanical inspections that are currently addressed by other parts of the regulations. Although FRA believes these requirements are interrelated to the inspection, testing, and maintenance of freight power brakes, FRA believes that they are adequately addressed in other regulations and would only add to the complexity of this proposal causing confusion and misunderstanding by members of the regulated community. Furthermore, representatives of both rail labor and rail management have indicated that if a consensus proposal could not be developed within the RSAC process then FRA should proceed unilaterally with developing a proposal which tracks the current requirements, and that FRA should strictly enforce those requirements. Although FRA believes that the current regulatory scheme tends to create incentives to ''overlook'' or fail to conduct vigorous inspections, FRA also believes that the current regulatory scheme is an effective and proven method of ensuring safety and that many of the ''negative incentives'' can be greatly reduced by

strict and aggressive enforcement and with moderate, although comprehensive, revision of the requirements. Consequently, the content of this proposal is far less complex than the previous proposal and more closely tracks the current requirements related to the inspection, testing, and maintenance of the braking systems used in freight operations.

This proposal is intended to be a moderate revision of the current requirements related to the inspection, testing, and maintenance of the brake equipment used freight operations. These proposed changes are intended to balance the concerns of rail labor and management and would increase the effectiveness of the regulation. Since the passage of the Power or Train Brakes Safety Appliance Act of 1958, which required adoption of the AAR recommended practices as regulatory text, FRA has realized that improvements in clarity are badly needed. FRA believes that the current regulations need to be reorganized and updated, and that potential loopholes created by the current language need to be eliminated. Furthermore, FRA believes that completely new requirements are needed to address the qualifications of those individuals conducting brake inspections and tests. FRA also proposes to codify the statutory requirements related to the movement of freight equipment with defective or inoperative brakes. In addition, this proposal codifies and solidifies the maintenance requirements related to the brake system and its components and prevents unilateral changes to these provisions by the very party to which they apply.

This proposal also contains various incentives to the railroads to encourage the performance of quality brake inspections, particularly at locations where trains originate. These include incentives to use qualified mechanical forces to conduct brake system tests at major terminals where long-distance trains originate in order to move these trains greater distances between brake inspections than currently permitted. Consequently, this proposal retains the basic inspection intervals and requirements contained in the current regulations and preserves the useful elements of the current system; however, FRA believes that the proposed additions, clarifications, and modifications increase the safety, effectiveness, and enforceability of the regulations.

Discussion of Issues and General FRA Conclusions

The following discussions are grouped by major themes and primary issues addressed not only in the Freight Power Brake Working Group but also in the 1994 NPRM issued on power brakes and the oral and written comments submitted in relation to that document. In each of the major issue areas FRA has attempted to discuss previous proposals, the comments to those proposals, the information developed by the Working Group, and any proposals or recommendations made by members of the Working Group.

I. Accident/Incident History and Defective Equipment

FRA considers many factors in attempting to determine the relative condition of the industry as it relates to the safety of train power brake systems. Two factors which figure prominently in this determination are the number of recent brake-related incidents and the amount of defective brake equipment recently discovered operating over the railroad system, both of which provide some indication as to the potential or likelihood of future brake-related incidents. For purposes of this discussion, a brake-related incident is one that was reported to FRA as being caused by one of the following: brake rigging down or dragging; air hose uncoupled or burst; broken brake pipe or connections; other brake components damaged, worn, broken or disconnected; brake valve malfunction (undesired emergency); brake valve malfunction (stuck brake); hand brake broken or defective; hand brake linkage and/or connections broken or defective. FRA did not consider brake pipe obstruction-related incidents because they were fully considered at the time that FRA promulgated the final rule relating to the use of two-way end-of-train devices.

Table 1 below contains a compilation of the relevant brake-related incidents that have been reported to FRA over the past 5 years. The totals for 1997 reflect incidents through October 1997 and the incident rate reflects train miles for 1996 (latest available). Both the number of incidents and the number of train miles for 1997 will in all probability be higher when they are finalized. As the table clearly indicates, there were increases in both brake-related incidents and the incident rate between 1994 and 1996. The incident rate remains fairly low relative to other causes of derailments and collisions. However, it should be noted that the figures presented in Table 1 most likely do not accurately reflect the total number of incidents that are potentially linked, in some part, to brake-related causes and do not provide a complete picture of the costs associated with the identified incidents. FRA obtains information on most incidents directly from the railroads which generally identify the direct cause of an incident but may not sufficiently identify all of the contributory causes in a manner to permit FRA to conclude that the brake system played a part in the incident. Thus, FRA believes that there may be numerous incidents that occur in the industry which are at least partially due to brake-related problems, but which are ultimately more closely linked to human error or other mechanical problems and thus, are reported to FRA under those cause codes. Furthermore, the damage costs noted in Table 1 for the identified incidents are based on the damage to railroad property or equipment together with the costs of the injuries or fatalities involved. Thus, the damages presented fail to consider the costs associated with such things as: loss of lading; wreck clearance; track delay; environmental clean-up; removal of damaged equipment; evacuations; or the impact on local traffic patterns. Consequently, the railroad property damages have been multiplied by a factor of 1.5625 in an effort to capture these non-reported damages.[1]

TABLE 1.—BRAKE-RELATED INCIDENTS

Year	Number of accidents	Rate per million train miles	Injured	Killed	Damages [2]
93	15	0.024	0	0	$1,298,109
94	33	0.050	17	1	$2,440,347
95	43	0.064	2	0	$6,710,280
96	52	0.077	12	1	$10,534,903
97 [3]	29	0.043	1	0	$10,032,013

[1] AAR surveyed its members and reported that, on average, these other costs constitute an additional 56.25 percent of the reported damages.

TABLE 1.—BRAKE-RELATED INCIDENTS—Continued

Year	Number of accidents	Rate per million train miles	Injured	Killed	Damages [2]
Total	172		32	2	$31,015,653

A second factor that is considered by FRA, to some extent, in determining the relative condition of the industry in regard to the safety of power brake equipment is the percentage of equipment found with defective brakes during FRA inspections and special projects. The percentage of equipment with defective brakes was a contentious subject within the RSAC Power Brake Working Group. The problem of brake defect data and how it is collected and entered into the FRA database was debated at length. The issue is important for cost and benefit estimation of proposals put forth by labor and management and it is useful to examine the problem in detail. Data on brake defects is collected by FRA inspectors as they do rail equipment inspections. Defect data is also collected for special projects under the Safety Assurance and Compliance Program (SACP). In neither instance is the data collection procedure designed to be suitable for use in statistical analysis of brake defects.

In order to perform a statistically valid analysis, either all cars and locomotives must be inspected (prohibitively expensive), or a statistically valid sample must be collected. For the sample to be valid for the purpose of statistical analysis, the sample must be randomly selected so that it will represent the same characteristics as the universe of data. Random samples have several unique characteristics. They are unbiased, meaning that each unit has the same chance of being selected. Random samples are independent, or the selection of one unit has no influence on the selection of other units. Most statistical methods depend on independence and lack of bias. Without a randomized sample design there can be no dependable statistical analysis, and no way to measure sampling error, no matter how the data is modified. Random sampling ''statistically guarantees'' the accuracy of the results.

The sampling method used for regular FRA inspections is not random. It is more of a combination between a judgement sample and an opportunity sample. The opportunity sample basically just takes the first sample population that comes along, while the judgement sample is based on ''expert'' opinion. The sampling method used for SACP inspections is also a judgement sample, where FRA is focusing its inspections on a specific safety concern. This method is extremely prone to bias, as FRA is typically investigating known problem areas. Furthermore, some SACP inspections are joint inspections with labor. Consequently, it is unknown whether the final reports reflect only FRA defects, as many of the joint inspections had both AAR and FRA defects recorded.

Neither the regular FRA inspections nor the SACP inspections were designed for random data collection. Although both are very useful to FRA, they were not designed for this purpose and the data should be used carefully. FRA believes that data collected during routine inspections is the most likely data to accurately reflect the condition of the fleet. However, both FRA inspection data and SACP data lack any measuring device, a defect is a defect and no distinction is made between a critical defect versus a minor defect. Furthermore, there is no correspondence between defects and accidents (no estimated correlation coefficients were statistically significant). This does not mean that defects cannot lead to collisions or derailments as the lack of correlation could easily be a result of non-random sampling. Consequently, the data collected both during routine FRA inspections and under SACP cannot be used as a proxy for data collected by means of a random sample for the purpose of statistical analysis. The sample is not random, so no dependable statistical analysis may be performed.

The defect ratios for brake and brake-related defects from the FRA inspection database are shown in Table 2 below. The five-year average brake defect ratio is 3.84 percent. SACP data (which focuses on known problem areas) indicates that brake defect ratios as high as 35 percent have been found during the course of some investigations. FRA believes that the reality lies between the two, and that it is more likely to resemble the data collected during routine FRA inspections as FRA examines almost a ½ million freight cars and locomotives annually. However, brake defects may be more common than FRA inspection data indicates and the SACP data in all likelihood indicates that there are localized areas of concern or that some railroads have particular yards with persistent problems. *For purposes of the cost/benefit analysis of this proposal only,* the brake defect ratio is assumed to be the five-year average brake defect ratio and rounding up to 4 percent. The data indicates that a slight increase in the percentage of cars with brake defects has been reported by FRA during routine inspections over the last five years. Due to the limitations of the available data, as discussed in detail above, FRA is unable to determine whether the defect ratio increase is the result of increased non-compliance with existing regulations or the result of sampling bias.

TABLE 2.—BRAKE DEFECT RATIO

Year	Ratio (defective equipment/ equipment inspected)
1993	0.0336
1994	0.0347
1995	0.0369
1996	0.0419
1997	0.045
Average	0.0384

II. Inspection and Testing Requirements

As noted in the preceding discussions, the issues related to the inspection and testing of the brake equipment on freight trains are some of the most complex and sensitive issues with which FRA deals on a daily basis. A majority of the comments received with regard to the 1994 NPRM on power brakes issued in 1994 addressed the intervals and methods for performing the various proposed brake inspections and tests. Furthermore, the primary points of contention in the RSAC Working Group discussions centered on the performance of brake inspections and tests. Consequently, any proposed requirements related to the inspection and testing of freight power brakes must be viewed as the foundation on which

[2] Increased by 56.25% to reflect unreported damages.

[3] Based on train miles for 1996 and accidents through October, 1997.

the rest of the proposed requirements are based.

A. Brake Inspections—General

The current regulations are primarily designed around four different types of brake system inspections, these include: initial terminal; 1,000-mile; intermediate terminal; and a brake pipe continuity check. *See* 49 CFR 232.12 and 232.13. These brake system inspections differ in complexity and detail based on the location of the train or on some event that affects the composition of the train. Each of the inspections detail specific actions that are to be performed and identify the items that are to be observed by the person performing the inspection.

The initial terminal inspection described in § 232.12(c)–(j) is intended to be a comprehensive inspection of the brake equipment primarily required to be performed at the location where a train is originally assembled. This inspection requires the performance of a leakage test and an in-depth inspection of the brake equipment to ensure that it is properly secure and does not bind or foul. Piston travel must be checked during these inspections and must be adjusted to a specified length if found not to be within a certain range of movement. The brakes must also be inspected to ensure that they apply and release in response to a specified brake pipe reduction and increase. FRA recently issued enforcement guidance to its field inspectors clarifying that both sides of a car must be observed sometime during the inspection process in order to verify the condition of the brake equipment as required when performing an initial terminal inspection.

The current regulations require intermediate brake inspections at points not more than 1,000 miles apart. These inspections are far more limited than the currently required initial terminal inspections in that the railroad is required only to determine that brake pipe leakage is not excessive, the brakes apply on each car, and the brake rigging is secure and does not bind or foul. *See* 49 CFR 232.12(b). In the 1982 revisions to the power brake rules, FRA extended the distance between these inspections from 500 miles to 1,000 miles.

The current regulations also mandate the performance of an intermediate terminal brake inspection on all cars added to a train en route unless they have been previously given an initial terminal inspection. This inspection requires the performance of a leakage test and verification that the brakes on each car added to the train and the rear car of the train apply and release. *See* 49 CFR 232.13(d). Railroads are permitted to use a gauge or device at the rear of the train to verify changes in brake pipe pressure in lieu of performing the rear car application and release. The current regulations also require that cars that are added to a train with only an intermediate terminal brake inspection that have not previously been provided an initial terminal inspection must be so inspected at the next location where facilities are available for performing such an inspection.

The current regulations also require the performance of a brake pipe continuity test whenever minor changes to a train consist occur. This inspection requires that a brake pipe reduction be made and verification that the brakes on the rear car apply and release. Railroads are permitted to use a gauge or device at the rear of the train to verify changes in brake pipe pressure in lieu of visually verifying the rear car application and release. This inspection is to be performed when locomotive or caboose is changed, when a one or more consecutive cars are removed from the train, and when previously tested cars are added to a train.

In the 1994 power brake NPRM issued in 1994, FRA proposed a power brake inspection scheme in which various stated factors determined the distance that a freight train would be allowed to travel without additional inspection. *See* 59 FR 47732–47736. These factors included: the qualifications of the employee performing the initial terminal brake inspection; the extent of performance of supervisory spot checks of maintenance and inspection activity; the presence or absence of a single car test program on the railroad; the power brake defect ratio on outbound trains for the railroad; and the type of equipment used and installed on the train. Based on the conditions that were satisfied by the railroad, a train would be allowed to travel anywhere between 500 and 3,500 miles from the point of initial terminal without additional power brake tests or inspections. Thus, FRA proposed the elimination of the 1,000-mile inspection and replaced it with a sliding-scale performance-based inspection system. The inspection scheme proposed in the 1994 NPRM was an attempt to balance the competing views of rail management, which contended that trains can travel up to 5,000 miles between inspections, and rail labor, which contended that a 500 mile limit should be mandated as railroads are not living up to a commitment made in 1982 to perform quality initial terminal inspections. *See* 59 FR 47692–47693.

As noted above, railroad representatives and shippers of goods by rail vehemently opposed the 1994 NPRM. Many of these commenters objected to the possibility that most trains would be reduced to 500 miles between brake inspections and that the incentives for moving extended distances were unobtainable. They claimed that the brake inspection scheme contained in the 1994 NPRM would increase not only operational and delivery costs but would also substantially increase delivery times. These commenters believed that the 1994 NPRM failed to recognize the industry's improving safety record. Many railroad representatives also objected to the use of power brake defect ratios as a benchmark for determining the distances trains may travel between brake inspections. These commenters believed that defect ratios were an inappropriate performance standard in that it was too subjective and included items that were not related to the safe operation of a train. Several railroads also commented that the potential for being reduced to 500 miles between brake inspections based on defect ratios each quarter would require railroads to maintain facilities every 500 miles in order to be prepared for a reduction in distance.

Rail labor representatives also objected to the brake inspection scheme proposed in the 1994 NPRM. The primary objections these commenters raised involved the ability of railroads to continue to use train crews to conduct initial terminal brake inspections and the ability to move trains in excess of 1,000 miles between brake inspections. Most of these commenters believed that train crew personnel are not sufficiently trained to adequately perform initial terminal brake inspections. Several labor representatives also objected to the movement of a freight train beyond 1,000 miles without an additional inspection of the brake equipment. This objection was primarily based on their view that railroads have failed to abide by the commitment made in 1982, when the distance between such inspections was increased from 500 miles to 1,000 miles, that complete and perfect initial terminal inspections would be performed. These commenters also contended that the incentives proposed for permitting trains to travel extended distances were unenforceable and would result in extended movements of trains with no appreciable increase in the safety of those trains.

In light of these objections, FRA held the 1994 NPRM in abeyance and requested that alternative approaches be

submitted by interested parties. The AAR and its member railroads submitted an alternative performance standard approach based on mechanically-caused accidents per million train miles (APMTM). AAR's approach required various types of brake inspections to be performed based on the mileage the train will travel, and based on the railroad's performance versus the established foundation APMTM, the railroad could potentially move trains up to 3,600 miles with fewer inspection requirements. AAR's proposal also addressed certain maintenance requirements and permitted maintenance levels to be determined based on the accident level of the industry as a whole. In addition, the proposal permitted trains to depart initial terminals with 95 percent operative brakes and in some instances less than 95 percent operative brakes. The proposal also set limits on the enforcement actions that FRA could initiate based on a railroad's poor performance.

Several labor representatives strongly objected to AAR's alternative proposal claiming that the proposal was merely self-regulation disguised as a performance standard. These commenters contended that AAR's proposal provided railroads the ability to continue to manipulate data and statistics in order to reduce their safety and regulatory responsibilities. The BRC submitted substantial comments to FRA's 1994 NPRM as an alternative approach. The BRC's submission suggested that many of the proposed provisions were insufficient to ensure adequate compliance by the railroads. Consequently, the BRC made numerous recommendations for strengthening certain provisions contained in the NPRM and included: more stringent requirements regarding the inspection of trains; additional limitations on trains permitted to travel greater than 1,000 miles between brake inspections; enhanced documentation of all inspections performed by the railroad; and further limitations on the inspection abilities of train crew members.

At the time that alternative proposals were being submitted and reviewed, FRA was in the process of establishing RSAC. FRA believed that RSAC might be a good forum for addressing the issues and developing recommendations for revising the regulations governing power brake systems for freight equipment. Therefore, on April 1–2, 1996, the RSAC officially accepted the task of assisting FRA in development of revisions to the regulations governing power brake systems for freight equipment. *See* 61 FR 29164. As noted above, the RSAC Working Group met on numerous occasions to discuss various issues and proposals related to the inspection, testing and maintenance of freight power brake systems. As the meetings progressed it became clear that most of the issues being discussed by the Working Group were contingent on the outcome of the requirements related to the inspection and testing of the braking systems. Consequently, the Working Group created several smaller task forces composed of representatives of both rail labor and rail management to attempt to resolve these core issues.

On several occasions it appeared as though these smaller task forces might reach resolution of at least a large portion of the inspection and testing issues; however, after the individuals involved in these meetings presented proposals based on the discussions of the smaller group it appeared that either there was no agreement within the task force, the parties did not understand what was agreed to, or the parties disagreed as to whether an agreement was actually reached. Representatives of both rail management and rail labor submitted numerous proposals related to the inspection and testing of brake equipment. Many of the proposals were revisions or amendments to previous proposals based on the discussions of the Working Group at that time. Rather than attempt to reiterate the various proposals submitted by management and labor representatives, this document will attempt to outline the major provisions and discuss the similarities and differences of the various proposals in order to delineate the general positions of the parties involved. In order to facilitate this discussion, the proposals will generally be grouped as either a management proposal or a labor proposal. It should be noted that the items outlined below were developed over the period of a year, were developed as part of a series of intense negotiation sessions, were generally presented as part of a package by various parties with all of the requirements of the package necessary for agreement, or were presented in order to facilitate additional discussion of the group.

The proposals of both management and labor representatives addressed the need to have brake and other mechanical inspections performed by qualified inspectors. The proposals mandated that if certain inspections were performed in a specified manner by highly qualified inspectors then those trains could be moved either extended distances between brake inspections or with a certain minimum percentage of the brakes inoperative or both. However, the parties differed on what constitutes a qualified inspector. This issue became the key issue to resolving any of the other issues being debated within the Working Group. Rail management proposed the use of the term ''mechanically qualified personnel'' (MQP) to describe those individuals they would consider highly qualified inspectors. It was unclear from the railroads' proposals exactly who could be designated as MQP and the extent of the knowledge or training that would be required to designate a person as MQP. It appeared that even train crew personnel could qualify as MQPs under certain circumstances. Labor representatives refused to accept any definition of MQP that would permit train crew members to meet the designation. These representatives were adamant that only carmen or individuals similarly trained and experienced were qualified to perform the quality brake and mechanical inspections contained in the proposals except in limited circumstances. At a minimum, labor representatives sought to have the railroads commit to using carmen or individuals similarly trained and experienced to perform the majority of the proposed inspections and tests. The railroads refused to agree to such a commitment. Railroad representatives objected to the designation of the carman craft in the rule text based on their belief that the discussion of such designation would violate existing collective bargaining agreements. Labor representatives disagreed that such discussion was a violation of any collective bargaining agreements. Due to the nature of these objections, several members of the Working Group believed they were unable to continue deliberations which led to an adjournment of the Working Group. Consequently, the Working Group was unable to resolve the issue of what qualifications a person must possess in order to adequately perform brake system inspections and tests.

Both labor and management representatives proposed to limit the movement of trains inspected by train crews to at least 500 miles. The railroads proposed that trains inspected by train crews would be required to be inspected by an MQP within 500 miles of the train's departure. It should be noted that the railroads' proposal of this requirement was part of a package that permitted certain trains inspected by MQPs to travel to destination without additional inspection and that permitted all trains to be operated out of initial terminals and elsewhere with only 95

percent operative brakes. The railroads contended that the only way to economically justify a return to a 500-mile inspection would be to permit trains to move extended distances and to relax the requirements pertaining to the movement of defective equipment.

Rail labor proposed that trains inspected by train crews be permitted to move only to the next yard, repair point, or crew change point not to exceed 500 miles where it would be inspected by carmen. This proposal permitted train crews to perform a ''cursory'' brake and mechanical inspection at the initial terminal. Labor representatives contended that train crews are not properly trained and do not possess the experience to adequately perform the initial terminal brake test and mechanical inspections required by the current regulations. These parties also contend that when the regulations were revised in 1982 to permit trains to travel 1,000 miles between brake inspections the carriers committed to perform quality initial terminal brake inspections, which they contend has not occurred and will not occur if train crews are permitted to perform initial terminal brake inspections. Consequently, the labor representatives contended that their proposal was an attempt to hold the railroads to their 1982 commitment while permitting properly qualified train crews to perform the inspections they are capable of performing.

The proposals of both rail labor and rail management also contained provisions regarding the performance of a 1,000-mile brake and mechanical inspection. The railroads proposed that all trains would receive a brake and mechanical inspection at 1,000 mile intervals performed by MQPs. However, the railroads' proposal also permitted certain trains that are inspected by MQPs at the initial terminal and which depart those locations with 100 percent operative brakes to travel to destination without additional inspection if labor jointly agreed to such operations. Labor's proposal required the performance of brake and mechanical inspections on every train at intervals of every 1,000 miles regardless of the quality of the previous inspections. Labor's proposal permitted the movement of a train beyond 1,000 miles without inspection only through the filing of a joint labor/management waiver petition pursuant to a proposed waiver process.

The proposals of both rail management and rail labor attempted to provide benefits to a railroad that conducted inbound brake and mechanical inspections. The railroads' proposals contained requirements for the performance of inbound brake and mechanical inspections by MQPs. The carriers proposed the requirements as an alternative to the complete inspection of the train when it is assembled and outbound. All cars found during the inbound inspection with cut-out or defective brakes were to be removed from the train and given a repair track air brake test. In addition, all cars found with mechanical or safety appliance defects were to be repaired or switched out of the train. The railroads' proposals permitted trains to depart these locations with only 95 percent operative brakes. The railroads' proposals did not require the performance of inbound inspections but were intended to alleviate some of the inspection requirements on outbound trains since they were performed inbound.

Rail labor's proposals also included provisions for the performance of inbound brake and mechanical inspections. Labor proposed that these inspections must be performed by carmen. The basic requirements regarding the treatment of defective equipment were similar to those proposed by the railroads. Labor's proposal also contained provisions requiring dynamic brakes, event recorders, and two-way EOTs. Labor representatives attempted to provide an incentive to railroads that perform inbound brake and mechanical inspections by permitting railroads to depart with only 95 percent operative brakes from locations where these inbound inspections are performed. If a railroad performed all of the inspections on the outbound trains, however, then labor's proposal required 100 percent operative brakes from those locations.

Both the labor and management proposals also addressed the method by which the various proposed inspections were to be performed. Railroad representatives proposed that mechanical inspections be conducted on both sides of each car where physically possible. These proposals also indicated that brake inspections could be conducted on one side of the cars during the set and one side during the release with a roll-by option if the design of the car permits the observation of the application and release from one side of the car. However, the proposals do not require a mechanical inspection at 1,000-mile brake inspections and fail to specify exactly how the brakes are to be observed during this inspection. Thus, the railroads' position regarding the precise method of performing a brake inspection when not combined with a mechanical inspection is somewhat unclear. The railroads also proposed that piston travel be observed on each car during every brake inspection except a continuity check, thereby mandating that inspectors cross over the cars if necessary to view the piston travel.

Rail labor representatives proposed detailed requirements relating to the methods for performing a proper brake inspection. These individuals proposed that both sides of a train must be walked during both the application and release of the brakes. These representatives believed that the only way to view all of the equipment necessary to conduct a proper brake inspection is by walking the train. Labor's proposal did permit trains that receive a mechanical inspection pursuant to Part 215 by a carman to have its brakes inspected by a walking inspection of one side of the train with the option to use a vehicle on the other side during the application of the brakes. Such trains also had the option to use a vehicle or perform a roll-by inspection on both sides of the train to observe the release of the brakes. Labor's proposals also permitted carriers to conduct an inspection of the application of the brakes and its component parts from one side of the train and the release of the brakes from the other side of the train if the carrier could effectively demonstrate that the design of the cars is such to permit the brake application, brake release, and component parts to be observed from one side of the train.

The proposals of both rail management and rail labor also addressed the inspection of cycle trains (i.e., trains that operate in a continuous cycle between two points, that remain intact, and that generally consist of cars of the same mechanical type). Both proposals required that cycle trains receive a mechanical and initial terminal brake inspection based on the distance the train has traveled. The railroads' proposal would require these inspections at 1,000 mile intervals. Whereas, the labor proposal required the inspections once every cycle for trains traveling between 500 and 1,000 miles between origination and destination, and once every other cycle for trains traveling less than 500 between origination and destination.

FRA Conclusions. Based on consideration of the information and proposals outlined above as well as its experience in the enforcement of the current power brake regulations, FRA believes that the alternative proposals submitted in response to the 1994 NPRM, as well as the proposals developed as part of the RSAC process, are not viable models upon which a revision of the freight power brake

requirements can be based. The alternative approach submitted by AAR in response to the 1994 NPRM contains a performance standard based upon the number of mechanically-caused incidents per million train miles. FRA does not believe this is an appropriate standard on which to base the frequency of brake inspection and maintenance requirements. Such a standard is based on the occurrence of incidents rather than on a factor which could measure a railroad's performance prior to an accident occurring and thus, prevent incidents before they happen. In addition, the applicability of the standard to the entire industry would be difficult to calculate on a railroad-by-railroad basis, especially due to the large number of short line railroads currently operating in the country. The proposed performance standard is also very subjective as many incidents are due to a variety of causes only part of which may be a mechanical or brake related cause. Thus, identifying what actually constitutes a mechanically-caused incident would be very difficult, if not impossible in some circumstances. Furthermore, as the calculation of the performance standard would be based on incident information submitted to FRA by the railroad's themselves, the potential for data manipulation would exist which could cast doubt on the validity and accuracy of the performance standard.

The AAR's alternative proposal also seriously limited FRA's ability to take necessary enforcement actions until a railroad's non-compliance resulted in a substantial increase in mechanically-caused incidents. In addition, the restrictions imposed on a railroad with poor performance would have permitted the railroad to operate under more lenient inspection requirements than the current power brake regulations. The proposal also permitted the operation of trains out of initial terminals with only 95 percent operative brakes and thus, would potentially permit cars with inoperative brakes to be moved past locations where the necessary repairs could be performed which would be contrary to the statutory provisions related to the movement of cars with defective brakes contained at 49 U.S.C. 20303. Consequently, FRA believes that the alternative approach submitted by the AAR in response to the 1994 NPRM is based on a very subjective performance standard, would be extremely difficult to enforce, is contrary to certain statutory requirements, and most likely would not achieve the same level of safety as the current regulations.

Although the proposals submitted by both rail labor and rail management during the discussions of the RSAC Working Group meetings contain elements which FRA believes would increase the safety of railroad operations, both proposals also contain elements that cannot be sustained on either a safety, economic, or legal basis. As noted in the discussion above, the proposals submitted by both labor and management were presented as packages. The parties made clear that the various elements contained in the proposals could not be isolated and be acceptable, they had to be considered in conjunction with all of the elements contained in the proposals. Therefore, FRA is reluctant to use any of the proposals submitted during the RSAC process as a basis for any revision of the power brake regulations. Furthermore, representatives of both labor and management indicated that if they could not reach agreement on the revision of the power brake regulations, then any revision contemplated by FRA should track the current inspection requirements and intervals.

Both proposals contained requirements restricting the movement of trains inspected by train crews to no more than 500 miles before the train would be reinspected by more highly qualified inspectors. However, railroad representatives stressed that their acceptance of a return to a 500 mile brake inspection was conditioned on and could only be economically justified if the railroads were provided the ability to move some trains to destination (i.e. 2,000 miles or more) as well as flexibility in the movement of defective equipment, both of which were included in their proposal. Whereas, labor representatives stated that the acceptance of permitting train crews to perform any inspections was conditioned on a commitment by the railroads to ensure that all other inspections would be performed by carmen or similarly trained personnel and that the current 1,000 mile interval between inspections be retained unless labor and management jointly agreed to an extension. Labor's proposal also would have permitted a ''cursory'' inspection to be performed by train crews at initial terminals in order to reduce the burden on railroads if a 500 mile inspection were adopted. Consequently, although both proposals contained a 500-mile restriction on trains inspected by train crews, both proposals also contained various other restrictions or conditions that were part of the 500-mile restriction that were very different and in FRA's view are irreconcilable.

Although FRA believes that a 500-mile inspection interval would most likely increase the safety on today's railroads, FRA does not believe that the return to a 500-mile interval is the most efficient or most cost-effective method of achieving the desired result, as discussed below in more detail. In FRA's view, many of the items proposed by the parties in order to make a 500-mile inspection interval a viable approach would have the potential for increasing the safety risks that already exist. For example, FRA is not currently willing to permit trains to travel extended distances without strict operational conditions being imposed and without a means to obtain information on the condition of such trains at the time they arrive at destination. Furthermore, FRA is concerned that any safety gains acquired from a 500-mile inspection interval would be negated by other provisions contained in the various proposals such as allowing the extended movement of defective equipment or the performance of ''cursory'' inspections by train crews at initial terminals.

As noted above, both proposals also contained provisions extending some flexibility in the movement of defective brake equipment. The railroads' proposal permitted the movement of any train with only 95 percent operative brakes and permitted the defective cars to be hauled as far as destination. Although the labor proposal limited the locations and trains where defective equipment could be hauled, the proposal did permit defective equipment to be hauled out of initial terminals and to destination if certain stringent inspection practices were implement by the railroad. Currently, 49 U.S.C. 20303 permits equipment with defective brakes to be moved only if the movement is necessary for conducting repairs and limits such movement to the nearest location where the necessary repairs can be effectuated. Therefore, both of the proposals were based, in part, on provisions designed to provide incentives to perform heightened inspections that are contrary to the statutory requirements regarding the movement of equipment with defective safety appliances. At the time these proposals were discussed by the members of the Working Group it was agreed that if a consensus could be achieved, then representatives of all parties involved would petition Congress in an attempt to change the current statutory requirements. As no consensus was reached, FRA is bound by the statutory requirements regarding

the movement of defective equipment and will not propose any requirements that are not in accordance with those provisions. (See discussion below titled ''Movement of Defective Equipment.'')

In 1982, when FRA extended the 500-mile inspection interval to 1,000 miles, FRA intended that quality initial terminal brake inspections would be performed by the railroads. FRA feels that railroads have not conducted the excellent initial terminal inspections that were contemplated in 1982. Furthermore, contrary to the railroads' contention, FRA feels that many initial terminal brake inspections are being performed by individuals who are not sufficiently qualified or trained. FRA recognizes that since 1982 new technology and improved equipment have been developed that allow trains to operate for longer distances with fewer defects. However, the key to achieving this improved capability is to ensure the proper operation and condition of the equipment at the location where the train is initially assembled.

Although FRA agrees that many of the initial terminal inspections conducted by train crews are not of the quality anticipated in 1982 when the inspection interval was increased from 500 miles to 1,000 miles, FRA believes that properly trained and qualified train crew personnel could perform certain brake inspections and some have been performing such inspections for several years. FRA believes that a reversion to a 500 mile restriction on trains inspected by train crews does not adequately address the concerns regarding the safety of these trains and would impose an economic burden on the railroads that cannot be justified. Two of the major factors in ensuring the quality of brake inspections is the proper training of the persons performing the inspections and adequate enforcement of the requirements. Therefore, FRA believes that the current 1,000 mile inspection interval should be retained but intends to propose general training requirements for persons conducting brake inspections. These proposed training requirements will include general provisions requiring both classroom and ''hands-on'' training, general testing requirements, and annual refresher training provisions. FRA is also proposing to require that various training records be maintained by the railroads in order for FRA to determine the basis for a railroad's determination that a particular person is considered qualified to perform a brake inspection, test, or repair. FRA believes these general training and recordkeeping requirements will provide some assurances that qualified people are conducting the required brake system inspections and tests.

FRA also intends to enhance and increase its enforcement activities with regard to the performance of the brake inspections and tests proposed in this NPRM, particularly those performed by train crews. FRA intends to make a concerted effort to focus on the qualifications of train crew members and will strictly scrutinize the method and length of time spent by these individuals in the performance of the required inspections. This may involve the review of event recorder tapes to ensure that a sufficient amount of time was afforded for conducting a proper inspection of the brake system. FRA will also focus its inspection activities to ensure that train crews are provided the proper equipment necessary to perform many of the required inspection.

In addition to focusing its enforcement and to aid in that initiative, FRA proposes to clarify, update, and modify the current inspection requirements in order to close what are perceived to be existing loopholes and to incorporate what FRA believes to be the best practices currently existing in the industry while updating the requirements to recognize existing technology. FRA believes, and many representatives of rail labor and management agree, that the current inspection requirements are very good for the most part and are sufficient to ensure a high level of safety, but that they need to be strictly enforced, clarified, and updated to recognize existing and new technology. Therefore, FRA does not propose an extensive revision of the basic brake inspection intervals or requirements. Rather, FRA proposes a moderate revision of the requirements, with the intent of tightening, expanding, or clarifying those inspection or testing requirements which have created enforcement problems or inconsistencies in the past. FRA intends to recognize some of the technological improvements made in the industry such as the use of two-way EOTs during the brake tests and use of the air flow method of qualifying train air brake systems. FRA also recognizes that some trains are capable of moving extended distances between inspections provided that comprehensive inspections are performed at the locations where the trains are originated. (See discussion below titled ''Extended Haul Trains.'')

In order to clarify the requirements regarding where and when various brake inspections and tests must be performed, FRA proposes to modify the terminology related to the power brake inspection and testing requirements contained in the current regulations, which is generally based on the locations where the inspections and tests are performed (*i.e.,* initial terminal, intermediate locations). Instead, FRA proposes to identify various classes of inspections based on the duties and type of inspection required, such as: Class I; Class IA; and Class II. This is similar to the approach taken by FRA in the 1994 NPRM and in the proposed rulemaking on passenger equipment safety standards. *See* 59 FR 47736–40. FRA believes that this type of classification system will avoid some of the confusion that currently arises regarding when and where a certain brake inspection must be performed.

Currently, the brake system inspection and testing requirements are interspersed within § 232.12 and § 232.13 and are not clearly delineated. Therefore, FRA believes that reorganizing the major types of brake inspections currently contained in the regulations into separate and distinct sections will provide the regulated community with a better understanding as to when and where each inspection or test is required. Although FRA proposes a change in the terminology used to describe the various power brake inspections and tests, the requirements of these inspections and tests will mirror the current requirements and are not intended to change or modify any of the voluminous case law that has been developed over the years regarding the inspections. Consequently, FRA proposes four major types of brake inspections to be performed by freight railroads some time during the operation of the equipment. FRA proposes the terms ''Class I,'' ''Class IA,'' ''Class II,'' and ''Class III'' to identify the four major types of brake inspections required by this proposal.

The proposed Class I brake test generally contains the requirements currently contained in § 232.12 (a) and (c)–(h). These requirements have been reorganized to clearly delineate when and how the inspection is to be performed based on current interpretations and comments received since the 1994 NPRM. The requirements have also been modified to require written notification that the test was performed and that this notification be retained in the train until it reaches destination. The proposed revisions also acknowledge the use of the air flow method for qualifying train brake systems and permits the use of end-of-train devices in the performance of the test. The proposal also provides some latitude to trains received in interchange

that have a pre-tested car or solid block of cars added at the interchange point or that are moved less than 20 miles after being received in interchange based on the relative safety of permitting these types of trains to continue without the performance of a comprehensive Class I brake test.

The proposed Class IA brake test clarifies the requirements for performing 1,000-mile brake inspections currently contained in § 232.12(b). The proposal makes clear that the most restrictive car or block of cars in the train determines when this inspection must occur on the entire train. FRA also proposes to require that railroads designate the locations where these inspections will be conducted and does not permit a change in those designations without 30-day notice or the occurrence of an emergency situation. The proposed Class II and Class III brake tests essentially clarify the intermediate terminal inspection requirements currently contained in § 232.13(c) and (d) regarding the performance of brake system inspections when cars are added en route or when the train consist is slightly altered en route.

In addition to the modifications and clarifications proposed with regard to the four major types of brake system inspections, FRA also proposes to retain, with clarification and elaboration, the basic inspection requirements related to transfer trains currently contained at § 232.13(e) as well as the requirements for performing brake system inspections using yard air sources currently contained at § 232.12(i). FRA also proposes to retain the requirements related to the inspection and testing of locomotives when used in double heading and helper service currently contained at § 232.15. FRA proposes some additional inspection requirements of locomotives when used in helper service or when used in distributed power operations to ensure the proper functioning of the brakes on these locomotives as these types of inspections are not adequately addressed in the current regulation. Furthermore, FRA does recognize in this proposal that trains, if properly inspected, can safely travel greater than 1,000 miles between brake inspections. (See discussion below titled ''Extended Haul Trains.'')

B. Extended Haul Trains

In the 1994 NPRM, FRA recognized that since 1982 new technology and improved equipment have been developed that allow trains to operate for longer distances with fewer defects. However, FRA further acknowledged that the key to achieving this improved capability is to ensure the proper operation and condition of the equipment, and that the best way of ensuring the proper operation and condition of equipment is to perform quality initial terminal brake inspections and to conduct proper equipment maintenance. Therefore, in 1994 FRA proposed a sliding-scale approach that based the allowable distance a train may travel between brake inspections on a variety of factors and based on the conditions that were satisfied by the railroad. Consequently, a train would be allowed to travel anywhere between 500 and 3,500 miles from the point of initial terminal without additional power brake tests or inspections. *See* 59 FR 47735.

As noted in the previous discussion, the AAR submitted an alternative proposal which would have permitted some trains to travel as far as 3,600 miles between brake inspections. Whereas, the BRC and other labor representatives objected to any movement beyond 1,000 miles based on the railroads' commitment to perform quality initial terminal inspections in 1982, which they claim has not happened. However, the proposals submitted by both rail labor and rail management during the RSAC Working Group deliberations provided provisions for the potential movement of trains greater than 1,000 miles between brake and mechanical inspections. (A detailed synopsis of these proposals is contained in the preceding discussion and will not be reiterated). Admittedly, the proposals differed greatly regarding exactly which trains would be permitted the extended movements and the process by which such movements would be sanctified by FRA. However, all of the proposals stressed the necessity that any train permitted to travel longer distances between brake inspections would be required to be thoroughly inspected by highly qualified inspectors at its point of origin or early in the life of the train. Consequently, it is clear from the submitted proposals and the presentations made at the time they were presented that virtually every member of the industry acknowledges that the key to permitting trains to move extended distances lies in the quality of the inspection the train receives at or near the beginning of its journey.

FRA Conclusions. FRA continues to believe that if a train is properly and thoroughly inspected, with as many defective conditions being eliminated as possible, that the train is capable of traveling well over 1,000 miles between brake inspections. By this, FRA contends that not only must the brake system be in quality condition but that the mechanical components of the equipment must be in equally prime condition. As the distance a train is allowed to travel increases, the mechanical condition of the equipment is a key factor in ensuring the proper and safe operation of the train brake system throughout the entire trip. FRA also continues to believe that the best place to ensure the proper conduct of these inspections and to ensure that the train's brake system and mechanical components are in the best condition possible is at a train's point of origin (initial terminal).

In 1994, FRA proposed a set of requirements that must be met by a railroad in order to move a train up to 1,500 miles without performing additional brake inspections. The requirements included such things as low defect ratios, maintenance programs, and the performance of quality brake and mechanical inspections at a train's point of origin. FRA agrees with several commenters that some of the proposed requirements were overly burdensome and were partially predicated on potentially subjective standards. However, FRA continues to believe that many of the inspection requirements and movement restrictions proposed in 1994 are valid conditions that must be met in order to permit the extended movement of trains. These include: the performance of a quality in-depth brake inspection by a highly qualified inspector; the performance of a quality mechanical inspection by a person qualified under 49 CFR 215.11; and a restriction on the number of set-outs and pick-ups occurring en route. FRA also believes these trains must be closely monitored to ensure that both the brake system and mechanical components remain safely intact throughout the train's journey.

FRA proposes to permit certain designated trains to move up to 1,500 miles between brake and mechanical inspections provided the railroad meets various inspection and monitoring requirements, which FRA believes will ensure the safe and proper operation of these trains. As no trains are currently permitted to travel in excess of 1,000 miles between inspections, FRA is not willing to propose more than 1,500 miles between such inspections until appropriate data is developed which establishes that equipment moved under the proposed criteria remains in proper condition throughout the train's trip. FRA believes that the proposed provision requiring the performance of an inbound inspection at destination or at 1,500 miles and the requirement that carriers maintain records of all defective

conditions discovered on these trains create the bases for developing such data. In order to ensure the accuracy of the data as well as ensure the proper and safe operation of these trains, FRA also proposes that these trains have 100 percent operative brakes and contain no cars with mechanical defects at their points of origin and at the time of departure from the 1,500 point, if moving an additional 1,500 miles from that location between brake inspections. FRA further proposes that these trains not conduct any pick-ups or set-outs en route, except for the removal of defective equipment, in order to minimize the disruptions made to the integrity of the train's brake system and reduce mechanical damage that may occur during switching operations. In addition, there is currently no reliable tracking system available to FRA to ensure that cars added to the train en route have been inspected in accordance with the proposed requirements.

As noted earlier in the discussion, FRA believes that in order for a train to be permitted to travel 1,500 miles between inspections, the train must receive inspections that ensure the optimum condition of both the brake system and the mechanical components at the location where the train originates. In order to ensure that these quality inspections are being performed, FRA proposes to require that they be performed by highly qualified and experienced inspectors. As FRA intends the Class I brake test that is required to be performed on these trains at their point of origin to be as in-depth and comprehensive as possible, FRA believes that these inspections must be performed by individuals possessing the knowledge to not only identify and detect a defective condition in all of the brake equipment required to be inspected, but also possess the knowledge to recognize the interrelational workings of the equipment and the ability to trouble-shoot and repair the equipment. Therefore, FRA proposes the term ''qualified mechanical inspector'' to identify and describe those individuals it believes possess the necessary knowledge and experience to perform the proposed Class I brake tests on these trains.

A ''qualified mechanical inspector'' is a person with training or instruction in the troubleshooting, inspection, testing, maintenance, or repair of the specific train brake systems the person is assigned responsibility and who's primary responsibilities include work generally consistent with those functions. (See § 232.5 of the section-by-section for a more detailed discussion of ''qualified mechanical inspector.'') FRA further believes these same highly qualified inspectors must be the individuals performing the proposed inbound inspection on these extended haul trains in order to ensure that all defective conditions are identified at the train's destination or 1,500 mile location. Similarly, FRA proposes that all of the mechanical inspections required to be performed on these trains be conducted by inspectors designated pursuant to 49 CFR 215.11, rather than train crew members, in order to ensure that all mechanical components are in proper condition prior to the train's departure.

C. Air Flow Method

The air flow method (AFM) of train air brake testing monitors the rate of air flow through the automatic brake valve to the brake pipe by the means of a brake pipe flow indicator. The AFM of brake testing is a more comprehensive test than the present leakage test. The leakage method only measures the amount of leakage from the brake and branch pipes, whereas the AFM tests the entire brake system including the reservoirs and control valves. In addition, the leakage method does not test the capability of the pressure-maintaining feature of the 26L brake equipment. The AFM, on the other hand, tests the brake system just as it is operated, with the pressure-maintaining feature cut in.

The AFM of qualifying train air brake systems has been allowed in Canada as an alternative to the leakage test since 1984. In addition, several railroads in the United States have been using the AFM since 1989 when the AAR's petition for a waiver of compliance was granted allowing the AFM as an alternative to the leakage test. In order to determine if the AFM of train air brake testing should be included as an alternative to the leakage test, FRA requested comments from interested parties in the ANPRM regarding the operating history of the AFM. *See* 57 FR 62552.

The AAR and several railroads commented on the operating experience of using the AFM. These commenters reported that the AFM is an effective and reliable method of qualifying train brakes and that the greatest benefit of the method is the information it provides to the train crew. CP Rail reported that testing on the AFM started in Canada in 1975 and became an alternate method of qualifying train brakes in 1984. CP Rail as well as several other railroads stated that they have experienced no problems with the method. Conrail commented that, although it initially experienced problems with sticking pointers, defective check valves, and protruding screws on the air flow meters, these problems have been eliminated. Conrail also stated that use of the AFM has indicated a slight reduction in undesired emergencies. Several railroads commented that the AFM provides information to the train crew regarding the brake pipe that is not provided by the leakage test. Two railroads responded that in all the years they have used the AFM they have experienced no instance where a train had to stop because the air flow could not be maintained. The AAR maintained that the failure rate of the air flow indicators is less than 1 percent. In fact, Conrail stated that it performed 9,000 air flow indicator calibrations in 1992 and found only 90 defective indicators. Several railroads commented that they currently calibrate the air flow meters on a 60-day to 92-day basis and have no problem with current calibration procedures. Two railroads noted that they initially had problems calibrating the devices due to orifice sizes but have since cured this problem. One railroad mentioned that it had problems calibrating the devices in extremely cold weather until it applied condition eight of FRA's waiver to the calibration of the gauge on the locomotive as well as the test orifices. (''The air flow indicator calibration test orifice shall be calibrated at temperatures of not less than 20 degrees Fahrenheit.'')

Railroad representatives unanimously opposed any requirement that would make using the AFM mandatory or the sole method of qualifying brake systems. All railroad commenters supported the adoption of the AFM as an alternative to the leakage test for qualifying braking systems. Most of these commenters suggested that the use of either method is an economical or operational decision that should be made by each individual railroad. One railroad recommended that trains qualified under the AFM should be requalified with the leakage test if the air flow indicator fails en route. The cost figures presented by the AAR and several railroads for equipping locomotives with air flow meters range from $350 to $1,450 per unit.

Both the Railway Labor Executives' Association (RLEA) and the BRC as well as several individual carmen opposed the adoption of the AFM as an alternative method of qualifying brake systems. The parties felt that the leakage test is the only reliable method for determining the integrity of the air brake system and for identifying leaks. These commenters stated that the AFM only determines whether the brake pipe is

compensating for existing leaks and does not identify the severity of the leak, and thus, trains would be allowed to operate with leaks over 5-psi, which is dangerous especially in cold weather and could result in an emergency application or derailment.

Westinghouse Air Brake Company (WABCO) responded stating that both the leakage test and the AFM combined with the 15-psi gradient restriction are effective and acceptable methods of qualifying braking systems. WABCO commented that the 60-CFM limit required by the AFM and the 5-psi limit required by the leakage test are both conservative figures in view of today's braking system capabilities, and that the 5-psi limit was derived long before today's pressure maintaining feature which is an integral part of all locomotive brake valves. WABCO stated that front-to-rear gradient is the most important element of braking performance and that long trains with a 15-psi gradient can be operated with no problem. This commenter also mentioned that the 60-CFM limit of the AFM would allow higher leakage on shorter trains but nothing that would cause a problem in brake operations if the 15-psi gradient is maintained.

Based on these comments, FRA proposed the air flow method as an alternative method for qualifying train brake systems in the 1994 NPRM. *See* 59 FR 47734. In response to this proposal, labor representatives continued to express opposition to the use of the air flow method as an alternative to the leakage test contending that it would not accurately measure the overall leakage in a train's air brake system. At a minimum, these commenters recommended that short freight trains not be allowed to use the air flow method as it may allow their operation with excessive leakage; however, these commenters did not provide an indication on what the size limitation should be. These commenters also urged FRA to adopt a 92-day calibration period as that is current practice. The proposals submitted by railroad management in the RSAC Working Group meetings included the option of using the air flow method when performing brake inspections. The Working Group did not address this portion of the carrier's proposal since the discussions were focused on more general requirements related to the inspection and testing of brake equipment.

FRA Conclusions. FRA believes that if a train contains a locomotive equipped with 26L freight locomotive brake equipment and the train is equipped with an EOT device, that train should be allowed to be qualified using the AFM. The AFM would be an alternative to the leakage test for qualifying properly equipped freight train brake systems. FRA recognizes the concerns of several labor organization commenters opposing the adoption of the AFM; however, FRA believes these commenters' apprehension is based on their unfamiliarity with the method. As FRA pointed out in the ANPRM and the 1994 NPRM, and as several commenters confirmed, the AFM is a much more comprehensive test than the leakage test. *See* 57 FR 62551, 59 FR 47682–47683. The AFM tests the entire brake system just as it is used, with the pressure-maintaining feature cut in. The method has been allowed in Canada since 1984 without any problems. Based on the comments from several railroads and information obtained during the method's testing from 1981 to 1988, FRA feels the AFM is an effective and reliable alternative method of qualifying train brakes. Although FRA is not mandating the use of the AFM, FRA does encourage railroads to use the method on all trains, not necessarily for qualifying the brake systems, but as a means of providing additional information regarding the brake system to the train crew. FRA further believes that calibration of the air flow indicators should be performed at least every 92 days, based on the fact that it is the calibration period required by the current FRA waiver granted to the AAR and because most railroads stated that they already calibrate the air flow indicators every 60 to 92 days and gave no indication that the period should be altered. *See* 54 FR 5195 (Feb. 1, 1989).

FRA also shares the same concerns as some commenters in allowing the use of the AFM as a means of qualifying braking systems on relatively short freight trains. FRA tends to agree that due to the shorter length of these types of trains the use of the AFM to qualify their brake systems might allow these trains to operate with excessive brake pipe leakage. However, FRA also tends to agree that if the proposed 15-psi gradient is maintained then the leakage on these shorter freight trains should not cause a problem in brake operations. Furthermore, FRA is not currently able to adequately delineate those freight trains, if any, that should not be afforded the option of using the AFM. Consequently, FRA seeks comment from interested parties on the following:

1. What is the current industry practice and experience regarding the use of the AFM on relatively short freight trains?

2. Is there an identifiable train length at which the use of the AFM creates the potential for a train to operate with excessive leakage?

D. Brake Pipe Reduction

Present regulations require brake-pipe reductions of either 15 pounds, 20 pounds, or full service depending on which of the required train air brake test is being performed. *See* 49 CFR 232.12, 232.13. In the ANPRM, FRA sought comments from interested parties to determine if it is feasible and beneficial for FRA to establish one standard brake-pipe reduction for all required train air brake tests. *See* 57 FR 62556.

The AAR and several railroads recommended that some type of performance standard be established so that each railroad could determine the amount of reduction that best suits its operation. The AAR also suggested that if the reduction amounts were left in the discretion of the individual railroads, it would be receptive to a requirement that the railroad indicate what reduction rates it would use at different locations. Several railroads commented that one standard reduction should be required for all tests and inspections and that the standard should not require an increase to a full service reduction because such a practice could cause undesired releases. These commenters also noted that one standardized reduction for all tests would simplify air brake tests and make it easier for the railroads to train and instruct their employees. Most of the commenting railroads suggested a 20-psi reduction if a specific amount were established.

Representatives of several labor organizations recommended that one standard reduction be established by FRA rather than allowing each individual railroad to determine their own reductions. This recommendation was based on the commenters' concern that varying reduction standards among the railroads would cause confusion for train crews since many railroads swap trains and operate crews over each other's lines. These commenters also felt that one standardized reduction would make training easier.

In the 1994 NPRM, FRA proposed a standardized brake pipe reduction of 20-psi for all required brake inspections and tests. *See* 59 FR 47688. The only response FRA received to this proposal was from the BRC which contended that a 20-psi reduction was not good for determining brake pipe leakage since the higher the pressure in the brake pipe, the greater the leakage. This commenter recommended that FRA retain a 15-psi reduction requirement for the performance of the leakage test.

FRA Conclusions. FRA intends to again propose a standardized brake pipe

reduction of 20-psi for all brake inspections except in regard to the brake inspection performed on a transfer train. Due to the lower air pressure at which the transfer train brake test is performed, FRA believes that requiring only a 15-psi reduction during this inspection is the most effective for ensuring the proper operation of the brake system on these train. FRA recognizes BRC's concerns regarding impact of an increased air pressure reduction on the performance of the leakage portion of a brake test; however, FRA believes that the concerns are addressed by FRA's proposal to increase the minimum pressure at the rear of the train from 60-psi to 75-psi. Furthermore, FRA agrees with many of the commenters that a standardized brake pipe reduction of 20-psi is sufficient for the performance of all other required brake inspections and tests. FRA believes that the adoption of one standard reduction will simplify both the performance of the required inspections and the training of employees charged with performing these inspections. Under the proposal, FRA would no longer require full service reductions for any of required inspections in order to avoid the possibility of undesired releases.

FRA believes that the suggestion of several commenters to allow each railroad to determine its own brake pipe reduction is not viable. It is not uncommon to find train crews operating in several different locations or to find the train crew of one railroad operating the equipment belonging to another railroad or operating over the lines of another railroad. Thus, if various reductions were established by different railroads or by one railroad in different locations, it would cause further confusion in both the performance of the inspections and the training of personnel.

E. Charging of Air Brake System

Present regulations for air brake testing basically require that cars that have previously been tested in accordance with the regulations either ''be kept charged until road motive power is attached'' or be retested. 49 CFR 232.12(i). Based on longstanding administrative interpretation and practice, FRA presumes that a brake system is no longer adequately charged if disconnected from the charging device (supply of pressurized air) for more than two hours before coupling of locomotives; otherwise, retesting is required. In the ANPRM, FRA requested comments from interested parties regarding the viability of this interpretation and sought information for developing alternative procedures that would not jeopardize safety. *See* 57 FR 62556.

The AAR and several railroads stated that there is no reason to assume that once a train is charged and tested and then left standing without being provided with a source of compressed air that the brake system would become defective. These parties suggested that leakage on standing trains has been greatly reduced through the use of welded brake piping and fittings and ferrule-clamped air hoses. These commenters felt that FRA's interpretation of allowing trains to sit without air for only two hours is from an era when this new equipment was not used. They also stated that FRA's current interpretation costs the industry money, fuel, and time and creates pollution because trains must either be reinspected or left with a locomotive attached and idling in order to avoid performing a full initial terminal test. Several railroads suggested that trains could be off air indefinitely if the consist is not altered, or at least as long as 24 hours, and remain in the same condition. Several commenters recommended that if a set of cars is off air for an extended period, all that should be required is a set-and-release test to assure the continuity of the brake pipe. CP Rail Services mentioned that there is no such two-hour rule in Canada and stated that in Canada if cars are off air for any length of time a set-and-release continuity test is required. Every commenting railroad felt the current two-hour interpretation is onerous and unrealistic.

The BLE, BRC, and several individual carmen felt that the current interpretation is reasonable. Most of these commenters expressed concern for the integrity of the brake system if a consist were left standing for longer than two hours. These concerns were aimed at the effect that climate might have on the equipment and the increased possibility of vandalism to the equipment if consists sat without air for longer periods. One conductor recommended returning to a four-hour limit as a minimum.

FRA Conclusions. In the 1994 NPRM, FRA proposed to permit trains to be removed from a continuous source of compressed air for up to four hours without requiring the re-performance of a comprehensive brake inspection. FRA received very few comments that directly addressed the safety implications of this proposal, thus, FRA intends to propose the four hour time limitation in this NPRM. FRA agrees that our longstanding administrative interpretation, that requires the retesting of cars disconnected from a charging device for longer than two hours, was established prior to the development of new equipment that has greatly reduced leakage problems, such as welded brake piping and fittings and ferrule-clamped air hoses. However, contrary to several railroads' assertions, FRA does not believe that cars should be allowed to be off air for extended periods of time without being retested. FRA believes that the longer cars sit without air attached the greater the chances are that the integrity of the brake system will be compromised. The longer cars sit the more susceptible they may be to weather conditions or even vandalism, as some commenters suggested. Consequently, based on today's equipment, operating practices, and overriding safety concerns, FRA feels that cars should not be disconnected from a continuous supply of pressurized air for longer than four hours without being retested. FRA also believes that the source of compressed air must be sufficient to maintain the integrity of the brake system. Consequently, FRA proposes to require that the source of compressed air be maintained at a minimum level of 60 psi.

III. Movement of Equipment With Defective Brakes.

The current regulations do not contain requirements pertaining to the movement of equipment with defective power brakes. The movement of equipment with these types of defects is currently controlled by a specific statutory provision originally enacted in 1910, which states:

> (a) GENERAL.— A vehicle that is equipped in compliance with this chapter whose equipment becomes defective or insecure nevertheless may be moved when necessary to make repairs, without a penalty being imposed under section 21302 of this title, from the place at which the defect or insecurity was first discovered to the *nearest available place at which the repairs can be made*—
>
> (1) on the railroad line on which the defect or insecurity was discovered; or
>
> (2) at the option of a connecting railroad carrier, on the railroad line of the connecting carrier, if not further than the place of repair described in clause (1) of this subsection.

49 U.S.C. 20303(a) (emphasis added).

Although there is no limit contained in 49 U.S.C. 20303 as to the number of cars with defective equipment that may be hauled in a train, FRA has a longstanding interpretation which requires that, at a minimum, 85 percent of the cars in a train have operative brakes. FRA bases this interpretation on another statutory requirement which permits a railroad to use a train only if ''at least 50 percent of the vehicles in

the train are equipped with power or train brakes and the engineer is using the power or train brakes on those vehicles and on all other vehicles equipped with them that are associated with those vehicles in a train.'' 49 U.S.C. 20302(a)(5)(B). As originally enacted in 1903, section 20302 also granted the Interstate Commerce Commission (ICC) the authority to increase this percentage, and in 1910 the ICC issued an order increasing the minimum percentage to 85 percent. *See* 49 CFR 232.1, which codified the ICC order.

As virtually all freight cars are presently equipped with power brakes and are operated on an associated trainline, the statutory requirement is in essence a requirement that 100 percent of the cars in a train have operative power brakes, unless being hauled for repairs pursuant to 49 U.S.C. 20303. Consequently, FRA currently requires that equipment with defective or inoperative air brakes make up no more than 15 percent of the train and that if it is necessary to move the equipment from where the railroad first discovered it to be defective, the defective equipment be moved no further than the nearest place on the railroad's line where the necessary repairs can be made or, at the option of the receiving carrier, to a repair location that is no further than the repair location on the delivering line.

In addition to the general requirements relating to the movement of equipment with defective safety appliances, FRA requires 100 percent operative brakes on trains departing initial terminal locations. The 100 percent at initial terminal requirement has been a standard by which the railroad industry has operated for decades and one which FRA has endorsed since its inception. The requirement is founded on Congress' incorporation of the AAR's rules, standards, and instructions as of April 11, 1958, regarding the installation, inspection, maintenance, and repair of train brakes. In 1958, Congress amended § 9 of the Safety Appliance Acts by incorporating the inspection requirements of the AAR into the statute and permitting their change only for the purpose of achieving safety.[4] Based on a review of the legislative history surrounding that amendment, FRA believes it is clear that Congress interpreted the AAR standards as requiring 100 percent operative on all trains prior to departure from an initial terminal. As the current regulations regarding the performance of an initial terminal inspection contained at 49 CFR § 232.12 (c)–(j) were basically an adoption of the AAR inspection and testing standards as they existed in 1958, FRA believes that the current regulations are intended and do require 100 percent operative brakes at initial terminals.

In the 1994 NPRM, FRA proposed conditions for the movement of equipment with defective brakes without civil liability which incorporated the stringent conditions contained in the Safety Appliance Acts, presently codified at 49 U.S.C. 20302, 20303, 21302, and 21304. *See* 59 FR 47728. FRA proposed the codification of these requirements in order to clarify the duties of a railroad and to ensure the safe movement of this equipment. In 1994, FRA further proposed that all cars and locomotives found with defective brake equipment be required to be tagged as bad ordered and determined safe to move by a qualified person in order to be deemed as being hauled for repairs. FRA also attempted to delineate when a location would be considered a repair location by interpreting that locations where repair trucks or vehicles had visited within the last 365 days would be considered repair locations for purposes of the proposal. *See* 59 FR 47697.

Several railroad representatives commented that FRA's interpretation of a repair location with regard to mobile repair trucks was inadequate, overly broad, and failed to consider many of the factors necessary for determining whether a location is a place where repairs can be effectuated. Labor representatives not only recommended that defective equipment not be allowed to move past a yard, siding, or other location accessible to a mobile repair truck, but also suggested a 125 mile limit on the movement of such equipment. In its alternative proposal to the 1994 NPRM, the AAR proposed that all trains could depart initial terminals with only 95 percent operative brakes, regardless of whether repairs could be effectuated at the location. This proposal was premised on the contention that there is not a safety risk posed by a train operating with 95 percent operative brakes and that FRA acknowledges this because it currently permits trains to operate with only 85 percent operative brakes. The AAR's alternative proposal also would have permitted some trains to operate with less than 85 percent operative brakes if appropriate operational measures were taken to move the train safely.

The proposals submitted by both rail labor and rail management representatives as part of the RSAC Working Group deliberations contained provisions for permitting the movement of equipment with defective brakes to be hauled from or past locations where the necessary repairs could be effectuated. Similar to the AAR's alternative proposal, the carrier's proposal would have permitted all trains to operate with only 95 percent operative brakes but would have capped the percentage at 90 percent rather the current 85 percent. As noted previously, the railroad's proposal was part of a package that included 500-mile inspections and flexibility in the movement of defective equipment was considered essential by the railroads in order to accept the reduced inspection intervals. Although labor's proposal permitted some trains to operate out of initial terminals and to destination with only 95 percent operative brakes, the proposal limited the flexibility to trains that were thoroughly inspected by carmen. Furthermore, labor's proposal was also presented as a package which included many other requirements intended to ensure the safety of permitting some trains to operate with a few defective cars entrained.

FRA Conclusions. It is clear from the preceding discussion that many of the proposals received by FRA since the issuance of the 1994 NPRM are in direct conflict with various statutory requirements. As the RSAC Working Group was unable to reach a consensus on the inspection, testing, and maintenance requirements for freight train brake systems, FRA is not willing or able to propose provisions regarding the movement of equipment with defective brakes that would be contrary to existing statutory mandates. Therefore, FRA intends to propose provisions related to the movement of defective equipment which are very similar to the requirements proposed in the 1994 NPRM. *See* 59 FR 47728. However, the current proposal clarifies the tagging requirements, contains provisions regarding the placement of defective equipment, and provides a consistent method for calculating the percentage of operative brakes on a train. Consequently, in addition to being consistent with the statutory requirements, FRA believes that the proposed requirements will ensure the safe and proper movement of defective equipment and will clarify the duties imposed on a railroad when moving such equipment.

FRA proposes that all cars or locomotives found with defective or

[4] In 1994, Congress recodified the federal railroad safety laws and 45 U.S.C. § 9 of the Safety Appliance Acts is currently codified at 49 U.S.C. §§ 20301 and 20302. The reference to the AAR rules, standards, and instructions was removed during the recodification as being obsolete. *See* Pub. L. 103–272 (July 5, 1994).

inoperative braking equipment be tagged as bad ordered with a designation of the location where the necessary repairs can and will be effectuated. FRA has again attempted to expressly clarify the requirement that equipment with defective brakes shall not depart from or be moved beyond a location where the necessary repairs to the equipment can be performed. Therefore, if a car or locomotive is found with defective brakes during any of the proposed brake inspections or while the piece of equipment is en route and the location where the defective equipment is discovered is a place where repairs of the type needed can be performed, that car or locomotive shall not be moved from that location until the necessary repairs are effectuated. However, if repairs to the defective condition cannot be performed at the location where the defect is discovered, or should have been discovered, this proposal makes clear that the railroad is permitted to move the equipment with the defective condition only to the nearest location where the necessary repairs can be performed.

What constitutes the nearest location where the necessary repairs can be performed is an issue FRA has grappled with for decades and has become exceedingly more difficult with the growing use of mobile repair trucks. In the preamble to the 1994 NPRM, FRA attempted to clarify the issue by stating that any location visited in the last 365 days by a repair truck or vehicle, capable of making repairs of the type required, would be considered the nearest point where repairs could be effectuated. *See* 59 FR 47697. After consideration of all of the comments received and based upon FRA's enforcement experience, FRA believes that this statement does not sufficiently address the issue and may lead to undesired consequences. FRA believes that mobile repair trucks are a valuable asset, not only economically for the railroads but also from a safety perspective, as they provide the ability to conduct repairs at outlying locations and thus, reduce the movement of defective equipment. It became apparent to FRA that the statement made in the 1994 NPRM regarding mobile repair trucks, would lead to railroads contending that various repair trucks lacked the capability of making brake repairs because the railroad voluntarily removed spare brake equipment and air compressors from the trucks, thus, circumventing the trucks' usefulness. In addition, the statement would tend to create a potential repair location whenever a truck was used to effectuate a repair at a location where it has never conducted repairs in the past, thereby, decreasing a railroad's incentive for performing repairs on a particularly hazardous piece of equipment if it is not a certain location.

Rather than attempt to develop a standard applicable to all situations, which FRA does not believe can be accomplished, FRA intends to approach the issue of what constitutes the nearest repair location based on a case-by-case analysis of each situation. FRA believes that its field inspectors are in the best position to determine whether a railroad exercised good faith in determining when and where to move a piece of defective equipment. In making these determinations both the railroad as well as FRA's inspectors must conduct a multi-factor analysis based on the facts of each case.

The following discussion is based upon the voluminous case law which exists that establishes the guiding principles for determining whether a location constitutes the nearest location where the necessary repairs can be made as well as previous guidance provided by FRA regarding identification of repair locations. In determining whether a particular location is a location where necessary repairs can be made or whether a location is the nearest repair location, the accessibility of the location and the ability to safely make the repairs at that location are the two overriding factors that must be considered in any analysis. These two factors have a multitude of sub-factors which must be considered, such as: the type of repair required; the safety of employees responsible for conducting the repairs; the safety of employees responsible for getting the equipment to or from a particular location; the switching operations necessary to effectuate the move; the railroad's recent history and current practice of making repairs (brake and non-brake) at a particular location; and relevant weather conditions. Although the distance to a repair location is a key factor, distance alone is not the determining factor of whether a particular location is the nearest location for purposes of effectuating repairs and must be considered in conjunction with the factors noted above. Existing case law makes clear that neither the congestion of work at a particular location or convenience to the railroad are to be considered when conducting this analysis.

FRA will continue to require 100 percent operative brakes on trains at their point of origin (initial terminal). As noted above, this has been a requirement in the railroad industry for decades and FRA believes it is not only wise from a safety standpoint, as it ensures the proper operation of a train's brake system at least once during its life, but it sets the proper tone for what FRA expects to be accomplished at these locations. FRA believes that requiring 100 percent operative brakes on all trains at their inception provides the railroads with a margin for failure of some brakes while the train is in transit (up to 15 percent) and tends to ensure that defective equipment is being repaired in a timely fashion. In addition, FRA believes that the 100 percent requirement is consistent not only with Congress' understanding of the AAR inspection standards that were adopted in 1958, but also with the intent of FRA, rail management, and rail labor as to what was to occur at initial terminals when the inspection interval was increased from 500 miles to 1,000 miles in 1982. At that time, carrier representatives committed to the performance of quality initial terminal inspections in exchange for an extension in the inspection interval, for which FRA intends to hold them accountable. In addition, the 100 percent requirement is consistent with the statutory requirements regarding the movement of defective equipment because a majority of the locations where trains are initiated have the capability of conducting virtually any brake system repair, and thus, the defective equipment could not be moved from those locations anyway.

FRA recognizes that the 100 percent requirement at points of origin tends to be somewhat burdensome for some railroads at certain locations. However, FRA has made clear in its technical bulletins that railroads are free to petition for a waiver of this requirement upon showing that it is not capable of making repairs at these locations and that alternative means are provided to ensure a similar level of safety at those locations. To date, no railroad has filed such a petition. Therefore, it appears that there are very few locations where the requirement is a burden and railroads are either capable of repairing the cars at those locations or have devised alternative means for moving the cars from those locations.

The latter portion of the preceding scenario is somewhat troubling to FRA. Currently, railroads are required to have 100 percent operative brakes at initial terminals, however, railroads are permitted to pick-up defective cars at these same locations, if the necessary repairs cannot be performed, and haul them for repairs. Thus, a situation exists wherein the railroad is required to set defective cars out of a train if the train

is initiated at that location, but are then able to pick-up those same defective cars in an en route train and haul them to the nearest location where the necessary repairs can be performed. FRA recognizes that this creates a somewhat illogical situation; however, FRA believes that by retaining the 100 percent requirement at these locations the public is assured that a train's brake system is in near perfect condition at the beginning of its journey, train crews are more cognizant of the presence of defective cars in the train when they are picked-up en route, railroads are more likely to perform repairs at a location where trains are initiated in order to avoid breaking-up trains to set-out defective cars once the trains are assembled, and FRA retains a clear and consistent enforcement standard that can be easily understood by its inspectors and railroad industry employees.

Although FRA has internally attempted to develop suitable industry-wide criteria for permitting trains to depart points of origin with a minimum number of defective brakes if the location is one where the necessary repairs cannot be made, FRA is not willing to permit such flexibility without fully considering the safety hazards or potential abuses which may accompany such an approach. Therefore, FRA seeks comment from interested parties regarding the potential for permitting very limited flexibility in moving defective equipment from outlying points of origin which lack the capability of effectuating brake system repairs. Of major concern to FRA is the potential for railroads to designate a large number of locations, where trains are initiated, as being unable to effectuate brake system repairs by merely closing existing repair facilities or reducing the capability of mobile repair vehicles at the locations. Therefore, any potential flexibility must ensure that only those locations that are truly incapable of performing brake system repairs, due the physical geography or design of the location, are afforded the flexibility. In addition, FRA must have the ability to approve any designation made by a railroad to ensure that the location is truly one in need of the flexibility and that the designated repair location is actually the nearest location where proper repairs could be made. Furthermore, any approach must also ensure the adequate identification and tracking of the trains and defective equipment moved from the location.

One potential method of ensuring limited designations is to require the designation of a location within a very short distance (50–100 miles) of the outlying location where all repairs will be conducted. Under this approach, FRA would strictly limit the percentage of inoperative brakes (5 percent or less) that could be moved in a train from that location and would require a qualified inspector to determine the safety of such a move. An alternative approach might include the ability of the railroad to perform something less than a full Class I brake test at the train's point of origin and permit the movement of the train a very short distance (50 miles or less) to a designated location where the train would receive a complete Class I brake test.

FRA believes that permitting some limited flexibility in this area might have the potential of actually increasing the safety of trains originating at some outlying locations that lack the ability to effectuate brake system repairs. It would likely reduce the amount of switching that occurs at these locations as defective equipment could remain entrained until it reaches a more conducive location for being repaired, inspected, or set-out of the train. It might also reduce the percentage of defective equipment which may move in any single train from some of these locations where run-through or local trains are used to move the defective equipment to another location for repair as railroads will not let the number of cars with defects build-up. In addition, it would reduce the distance that defective equipment is hauled before proper repairs are made since any approach would limit the distance such cars could be hauled before repairs or reinspection would be required. Furthermore, a more flexible approach might have the potential for increasing the quality of inspections since the restrictions for handling a defective piece of equipment would be somewhat less and trains would have the ability to be moved to a location where highly experienced inspectors are available.

In light of the preceding discussion, FRA seeks comments from all interested parties regarding the viability of permitting some flexibility in the 100 percent requirement for trains initiated at outlying locations that lack repair capability and seeks recommendations on potential approaches for permitting such flexibility. Specifically, FRA seeks comment or information on the following:

1. How many locations currently exist that are initial terminals for some trains that lack the capability of effectuating any brake system repairs? Partial repair ability? If so, what types of repairs can generally be made?

2. How many trains are currently initiated at locations that lack the capability to perform brake system repairs?

3. How do railroads currently handle equipment found with defective brakes at initial terminals that lack the ability to effectuate the necessary repairs?

4. What operational or recordkeeping requirements should be imposed on trains if they were permitted to depart a point of origin with a minimum number of cars with defective brakes entrained?

5. Are any of the potential safety benefits described above valid? What are the potential safety hazards or concerns in permitting such flexibility?

IV. Dynamic Brakes

The issue of dynamic brakes, and the extent to which FRA should impose regulatory requirements governing their use, if at all, is one which has prompted lengthy and animated debate between all affected parties since the issuance of the ANPRM in December 1992. Coincident with the drafting of the ANPRM, the Rail Safety Enforcement and Review Act amended Section 202 of the Federal Railroad Safety Act of 1970 (recodified at 49 U.S.C. 20141), and mandated, in part, that FRA, ''where applicable, prescribe regulations that establish standards on dynamic braking equipment.'' This specific mandate is derived largely from two NTSB recommendations to FRA concerning dynamic brakes following the Southern Pacific Transportation Company (SP) accident at San Bernardino, California on May 25, 1989.

In this accident, excessive tonnage and excessive speed cresting a 2.2 percent grade, complicated by the fact that the train crew had been provided erroneous information regarding available and operative dynamic brakes, led to a train that was out of control and was ultimately unable to stop before derailing. While the NTSB determined the primary cause of the accident to be the excessive weight of the train as compared to that reported to the train crew, a secondary cause was determined to be the fact that the engineer had far less operable dynamic braking available for use than expected. The combination of these two conditions likely led to flawed decision making by the train crew in developing train handling strategies for negotiating the grade safely. In its final report, the Safety Board issued the following recommendations to the FRA regarding dynamic brakes:

1. Study, in conjunction with the AAR, the feasibility of developing a positive method to indicate to the operating engineer in the cab of the controlling locomotive unit the

condition of the dynamic brakes on all units in the train.

2. Revise regulations to require that if a locomotive unit is equipped with dynamic brakes that the dynamic brakes function.

To reiterate the general explanation of the principles of dynamic braking, as provided in both the ANPRM (57 FR 62546) and 1994 NPRM (59 FR 47676), dynamic brakes were developed as a ''free'' by-product of the diesel-electric drive train. By engaging the dynamic brake, the normally powered traction motors on each axle are changed to generators, and the power generated is dissipated through resistance grids. The effect is similar to that of shifting an automobile to a lower gear when descending a steep grade. The additional hardware needed to outfit a locomotive with dynamic brakes includes the grids and the controls and switches.

The primary selling point of dynamic brakes has been the ability to reduce freight car brake shoe wear. The dynamic brake is also useful in controlling train slack in lieu of using the locomotive independent brake. Furthermore, use of the dynamic brake in controlling train speed in lieu of power braking, where the train brake is applied with the locomotive under power, is a major factor in fuel savings. Due to these benefits, railroads currently emphasize and encourage the use of dynamic brakes as evidenced through examination of numerous carriers' operating rules which dictate the use of dynamic braking as the preferred method of slowing and/or controlling a train, especially in heavy grade territory. Historically, dynamic brakes have been applied to locomotives at the individual railroad's option, primarily based on economic considerations. It is important to note that, at present, the vast majority of new locomotives procured by the railroads are equipped with dynamic brakes.

In order to determine the types of requirements or standards that should be developed regarding the design and use of dynamic brakes, FRA requested comments from interested parties regarding the reliability, testing, and cost of dynamic brakes as well as the types of information that are or could be provided to the engineer regarding the availability and operation of the devices. *See* 57 FR 62555. Comments were received from numerous interested parties, and were discussed at length in the 1994 NPRM. *See* 59 FR 47686. Nearly all of these comments parallel discussions that transpired throughout the RSAC Working Group deliberations and negotiations, discussed later in this section, and as such, are not reiterated here in an effort to avoid redundancy. In summary, while FRA was not persuaded that dynamic brakes warrant emphasis as the primary safety system, the agency recognized that the statute communicates a valid safety concern, properly construed. That is, to the extent significant emphasis is placed on dynamic brakes, either by the railroads as a legitimate means of limiting fuel consumption, undesired emergency brake applications, and wear to freight car components, or by safety critics who do not foresee that hazard of reliance on such systems, engineers may in fact be encouraged to make errors in judgment that take them beyond prudent safety margins. At such a critical point, proper functioning of any secondary safety system, however subject to failure, is very desirable. Further, dynamic brakes offer a redundant safety feature should the engineer make a mistake in judgment leading to excessive speed under the prevailing conditions of grade, tonnage, and weather.

Although FRA did not propose requiring that locomotives be equipped with dynamic brakes in the 1994 NPRM, FRA did acknowledge that Congress, in § 20141, intended for FRA to develop meaningful and enforceable standards regarding the safe use and operation of dynamic brakes. Accordingly, and upon considering comments received in response to the ANPRM, FRA proposed the following general requirements for inclusion in the 1994 NPRM:

(1) Engineers should be informed on the safe and proper use of dynamic brakes;

(2) Engineers should be provided with information regarding the total dynamic brake retarding force available on all outbound trains equipped with dynamic brakes;

(3) Railroads operating braking systems that include dynamic brakes should have written operating rules, tailored to the specific equipment and territory of each railroad, governing the safe handling procedures for the use of dynamic brakes under all operating conditions, including procedures covering the loss of dynamic brakes;

(4) Running tests of the dynamic brake should be performed whenever the motive power or engine crew is changed so that the availability, or lack of availability, of the device can be rechecked; and

(5) Locomotives built after January 1, 1996, and equipped with dynamic brakes, should be able to (i) test the electrical integrity of the dynamic brake at rest, and (ii) display the total train dynamic brake retarding force, at certain speed increments in the cab of the controlling locomotive.

Comments received during both the public hearings and in writing, following issuance of the 1994 NPRM, predominately reiterated comments provided in response to the ANPRM. Specifically, railroads and suppliers emphasized their contention that dynamic brakes are not the primary braking system for a train, but rather are economical devices utilized to increase the efficiency of their operations. These commenters clearly stated that the decision to equip and operate locomotives with dynamic brakes is one dictated by economics, and as such, should be governed by specific operating rules and not by federal regulation. A number of railroads noted that the technology has not been developed to continuously monitor the status of available dynamic brakes on trailing locomotive units. These commenters further questioned FRA's inclusion of such a requirement in the NPRM, noting that dynamic brakes can fail at any time, and tend to fail while in use, rendering a real-time display of available dynamic braking capacity somewhat meaningless when relied upon to develop train handling strategies. Several railroads also noted that running tests as prescribed in the NPRM are unnecessary, impractical, and may increase safety risks at some locations.

Railroad labor representatives commented that if locomotives are equipped with dynamic brakes, then they should be fully operative and functional at all times and they should be maintained on a regular basis. Rail labor provided comments in response to the ANPRM stating that they did not feel that dynamic brakes could be monitored, and even if they could, monitoring would probably not be that effective since dynamic brakes tend to fail in use. In contrast, however, rail labor testified during the public hearings and in written comments to the 1994 NPRM that they fully support the use of whatever technology is available to continuously monitor the status of available dynamic braking.

At the initial RSAC Power Brake Working Group meeting in May 1996, the working group members acknowledged the need for, and established a separate task force to specifically address the issue of dynamic brakes. The working group identified four broad areas relating to dynamic brakes to be further developed by the task force as follows: (1) Operational requirements; (2) available indicators; (3) en-route failures; and (4) testing and inspection. The task force

was comprised of representatives from FRA, labor, management, suppliers, and NTSB.

The task force initially focused its efforts on identifying alternative technologies capable of providing a locomotive engineer with information regarding dynamic brakes on trailing units. Various methodologies, at differing levels of development and/or testing, were discussed as potentially viable options to provide such information including: placement of an accelerometer in the lead locomotive; incorporation of indicator lights to inform the engineer whether dynamic brakes set up on trailing units; utilization of intra-train communication links; and utilization of the ECP train brake system under development to transmit the desired information. However, these discussions quickly refocused on the larger and more fundamental question raised during the 1994 NPRM and subsequent comments; namely, even assuming that technology is or will be available in the near future to continuously monitor the status of available dynamic brakes, is this information somewhat meaningless to the engineer when formulating braking strategies given the nature of dynamic brake failures. The task force quickly lost focus and direction while contemplating this larger, more complex issue, and solicited guidance from the full Working Group to refine the broad issues established at the initial meeting of the full Working Group and further define the specific issues and information to be developed by the task force.

The Working Group developed four specific issues for detailed review by the task force. First, if a locomotive is equipped with dynamic brakes, do or must they work. Railroad representatives on the task force maintained, consistent with previous comments, that an inoperative dynamic brake is not considered an impairment to train braking, and that the automatic brake is considered the primary brake capable of controlling the speed of the train under all conditions. These representatives noted that an engineer must be prepared to operate a train with only air brakes at all times since the dynamic brake may fail at any time without advance signs of deterioration. These commenters also stressed that it is not correct to speak of ''stopping'' a train through use of the dynamic brake because the locomotive must be in motion before any retarding force is generated. Simply restated, these representatives did not feel that dynamic brakes are safety devices, but rather are economical devices whose operation should be governed by the railroads' operating procedures and not through federal regulations.

Rail labor representatives on the task force countered by noting that many railroads have published operating rules which instruct engineers to utilize dynamic brakes as an integral part of their train handling techniques. More importantly, these task force members referenced an AAR research paper presented at the Air Brake Association Meeting in September 1991 which provided results from stopping distance tests performed in grade territory with double-stack equipment with approximately 101 tons per operating brake. Summarily, this report concluded that, ''From this it can be seen that trains such as this double-stack test train cannot be safely controlled on 3% grades with the service brake alone, and that dynamic brake failure on two or more units would require a train to be stopped with an emergency application on the grade.'' Given the current emphasis of many railroads' operating procedures regarding the utilization of dynamic brakes, labor representatives strongly recommended that the railroads be required to repair defective dynamic brakes within a specified interval. These task force representatives strongly believed that the failure of the current regulation to mandate the timely repair of locomotive units with inoperative dynamic brakes has resulted in the railroads being free to repair these units at their leisure based primarily on economics and convenience. Labor representatives contended that a requirement to repair inoperative dynamic brakes concurrent with the 92-day locomotive inspection interval would impose a minimal logistical burden on the railroad and would help ensure a locomotive fleet with operating and effective dynamic brakes.

All members of the task force discussed methods by which to allow a railroad to declare a locomotive unit ''not equipped'' without physically removing the hardware necessary for operation of the dynamic brakes. There was general agreement within the task force that such a provision was necessary, specifically when considering the needs of short line railroads. These railroads typically have limited need or desire to utilize dynamic brakes within their operating environment, but tend to purchase locomotives from larger Class 1 carriers that are equipped with dynamic brakes. Although there was general agreement regarding the necessity for such a provision, the task force members were unable to reach consensus on the particulars that would ensure declarations of ''not equipped'' were not made to intentionally circumvent any prescribed maintenance requirements that might be imposed. Concerns were also raised regarding the perceived ability of a railroad under such a provision to declare a locomotive ''not equipped'' one day and ''equipped'' soon thereafter based primarily on operational considerations and/or economics.

The second specific issue assigned to the task force by the Working Group centered on whether the level of dynamic brakes can or should be continuously monitored and conveyed to the engineer, and how the locomotive engineer is notified if the dynamic brakes do not work. Comments received in response to questions posed in the ANPRM, testimony provided in the public hearings, and discussions in both the Working Group and the task force deliberations have not identified an existing, accurate, and cost-effective means by which to provide the engineer a continuous, real-time status of dynamic braking availability and capacity. Absent such a real-time status indicator of dynamic brakes, rail labor representatives on the task force clearly advocated the need for engineers to be apprised of the status of the dynamic brakes on each unit in the locomotive consist, either verbally or in writing, prior to departing each initial terminal location and at each crew change location.

The task force considered utilizing accelerometers as an interim or alternative solution to the current lack of technology. Accelerometers have become very common in the industry in the last several years, and several demonstrations of an accelerometer's ability to display braking effort were reviewed by the task force. Using various locomotive simulators, task force members observed examples of dynamic braking on both relatively flat and heavy grade conditions which demonstrated how, in some cases, an accelerometer can provide more information to the engineer than a display of the amperage from the trailing locomotives. During the simulation exercise, the amperage reading remained unchanged on all locomotives in the simulated consist during the slow down, but the accelerometer provided information as to the actual braking effort of the dynamic brake through changes in its rate of deceleration value (expressed in mph/minute) as the dynamic brake slowed the simulated train through the dynamic brake's effective range. While additional simulations further demonstrated advantages of using

accelerometers as opposed to amperage readings, the task force did not collectively endorse this equipment as a solution to the issue of dynamic brake monitoring.

In addition to the uncertainty of available technology, the task force addressed the ancillary issue of ''information overload'' associated with an additional display being shown on the engineer's console. Task force members cited a parallel example of this phenomenon related to current radio-controlled distributive power equipment and its ability to display all conditions such as brake pipe, equalizing reservoir, amperage, throttle or dynamic brake position, and locomotive brake cylinder pressure on remote locomotives. Concerns have been expressed that the redundant information being provided via these screens is not being utilized by most locomotive engineers, and that such information simply clutters an already visually challenging control stand and may contribute to decreased levels of safety by drawing the engineer's attention away from other necessary duties.

The task force contemplated the feasibility and benefits of incorporating a ''dynamic brake light'' outside the cab of a locomotive to provide the engineer with a status display of available dynamic brakes. A strobe light was recommended in order to offer visibility in foggy, rainy, and other inclement weather conditions. Upon further discussion, this option was considered questionable in that it could prove to be a distraction to the locomotive engineer by directing his/her attention to the rear when critical braking decisions would require the attention of the engineer to be in the direction of travel. Several task force members also noted that the curvature of the track in certain locations could conceivably obscure visual contact with the light, while others maintained that a light alone offered little information about the actual performance of the dynamic brake and could simply mislead the engineer.

The third specific issue assigned to the task force for resolution involved the establishment and maintenance of records concerning dynamic brakes on locomotive units. This issue was not fully developed by the task force, in that any specific recordkeeping requirements are somewhat predicated on resolution of the previously discussed issues regarding whether or not locomotives need to be equipped with operative dynamic brakes. The task force noted that appropriate records would be required if specific maintenance intervals were established (i.e. at the 92-day locomotive inspection as discussed earlier), but no consensus was reached on this issue.

The last issue provided to the task force focused on en route failures of the dynamic brakes. Railroad representatives on the task force again stated that the dynamic brakes are not the primary braking system for the train, and that they are not used to actually stop the train. Based on this assertion, these representatives did not believe that any operating restrictions should be imposed on continued movement of the train should the dynamic brakes fail on a unit or units en route. Rail labor representatives on the task force refuted this position, and maintained that a railroad should implement a number of safeguards should a dynamic brake become inoperative en route. These representatives advocated a reduction in train speed if the defective dynamic brake is on the lead locomotive, and that no train be operated on certain grades (1 percent suggested) with inoperative dynamic brakes on the lead locomotive.

A stated objective of any task force is to develop and/or gather specific information, facts, and data directly relating to the issue; in this case, dynamic brakes. The task force pursued this by formulating and distributing a questionnaire to a number of engineers soliciting their input regarding the use of dynamic brakes, the importance of a display showing available dynamic braking force, and other related issues as discussed above. The results of this questionnaire clearly support the positions stated and advocated by rail labor representatives throughout this process. Specifically, 86 percent of the 138 respondents replied that operative dynamic brake is ''very'' important to safely control a train in grade territory, 93 percent of the respondents felt it to be ''very'' important that if a locomotive is equipped with dynamic brakes, they should be required to be operative, 86 percent of the respondents felt it to be ''very'' important the dynamic brakes should continue to function during emergency applications, 83 percent of the respondents are instructed to use dynamic brakes for fuel conservation, and a significant minority felt that a real-time display of available dynamic braking effort would ''overload'' the information provided on the control stand. This questionnaire was not conducted scientifically, nor was it intended to be a statistically valid sampling of dynamic brake issues and locomotive engineers throughout the country. It did, however, provide support and confirmation of views that have been presented by rail labor over the past 5 years regarding the importance of, and reliance on, dynamic brakes in train handling by locomotive engineers.

As illustrated in the discussions above, deliberations within the dynamic brake task force largely focused on the fundamental issues posed as early as 1992 in the ANPRM. The task force was unable to reach consensus on resolution of these issues, and ceased meeting as the negotiations within the inspection and testing task force dominated the RSAC proceeding. Dynamic brake issues were included in the subsequent negotiations and deliberations of the inspection and testing task force, but did not play an integral role in shaping the numerous proposals that were generated for discussion. At the completion of the Working Group activities, it was apparent that both labor and management representatives recognized that minimum standards need to be established for the operation, testing, and maintenance of dynamic brakes. Labor representatives continued to promote shorter maintenance and repair intervals, while management representatives were hesitant to jeopardize locomotive availability due to inoperability of a feature that they view as one which provides increased operational flexibility but which is not safety-critical.

FRA Conclusions. A wealth of information has been gathered regarding the operation, testing, and maintenance of dynamic brakes in the five years since the publishing of the ANPRM. Based on the information provided, FRA proposes appropriate standards for dynamic brakes that are consistent with the statutory mandate, that take into consideration NTSB recommendations, that potentially promote progressive improvements in dynamic brake information systems through the phased introduction of technology, and that avoid excessive requirements that discourage the use of dynamic brakes. As should be evident from the preceding discussion, FRA has been confronted with issues not limited to equipping locomotives with dynamic brakes, development of standards for dynamic brakes, or implementation of technologies to advise the engineer on the condition of dynamic brakes. Rather, given the increased emphasis on dynamic brake usage as prescribed in operating rules, it is paramount to consider whether the current emphasis on the use of dynamic brakes to achieve fuel efficiency and avoid wear on power brake components has resulted in issuance of train handling instructions that can lure the engineer into a trap in those situations where dynamic brakes

must be relied upon to control speed within a zone of safety.

The RSAC Working Group and task force deliberations provided no rationale to warrant a reconsideration of FRA's stated position that dynamic brakes do not offer the technical capability to serve as a primary train braking system since: (i) they provide braking force only on powered locomotive axles and are incapable of controlling in-train forces in the same manner as the automatic braking system; (ii) they are effective only within a narrow speed range and have no capability to actually stop a train; (iii) they can fail without prior warning; and (iv) their failure mode is characterized by loss of braking force (as opposed to the automatic brake, which, properly employed, initiates an emergency brake application upon loss of system integrity).

Similarly, however, the RSAC working group and task force deliberations reinforced FRA's belief that dynamic brakes have become, *de facto*, a second-order safety system where employed. While from the point of view of logical priorities, dynamic brakes ''back up'' the automatic train brake system, in sequence of operational procedures the priority is reversed. Stated differently, either the proper functioning of these systems, or the provision of reliable information concerning degraded functioning of these systems, should prevent locomotive engineers from operating trains in a manner that might make recovery through use of the automatic brake impossible. As between these two alternatives, proper functioning is marginally preferred, since communication, perception, and comprehension of information is not a uniformly successful enterprise.

In considering the entirety of the information available, FRA concludes that it is imperative that the locomotive engineer be informed in writing of the operational status of the dynamic brakes on all locomotives in the consist at the initial terminal or point of origin for a train or at other locations where a locomotive engineer first takes charge of a train. Therefore, FRA proposes to require that locomotive engineers be provided this information at these locations. This proposed provision directly addresses the foremost concern articulated by the NTSB following the San Bernardino accident. FRA also proposes to require visible identification of locomotive units with inoperative dynamic brakes. FRA is in full agreement that when locomotives are equipped with dynamic brakes, they should be in proper operating condition and be maintained on a regular basis, to the maximum extent practical, to enhance train handling. FRA does recognize that these maintenance requirements may be overly burdensome in some instances for railroads (primarily short lines) who do not utilize dynamic brakes in their respective operations, but yet own and operate locomotives equipped with dynamic brakes. Consequently, FRA further proposes provisions for deactivating a locomotive's dynamic brakes without physically removing the components. FRA also specifically solicits input regarding the placement of a locomotive in a consist that has been declared ''deactivated'' in accordance with this proposal. Some existing railroad operating rules dictate that a locomotive which has been determined to have inoperative dynamic brakes may be dispatched in a train, but prohibit its placement in the lead position of the consist. Are there technical reasons to prohibit a locomotive with inoperative dynamic brakes from functioning as the lead locomotive, providing the deactivated locomotive still has the capability to fully control the dynamic braking functions of all other locomotives in the consist that are so equipped?

In addition to the information and maintenance requirements, FRA also proposes the development of operating rules and training programs to ensure the proper and safe use of dynamic brakes. For example, FRA proposes to require that railroads operating trains with brake systems that include dynamic brakes develop, implement, and make available to FRA upon request written operating rules governing safe train handling procedures using these dynamic brakes under all operating conditions, which shall be tailored to the specific equipment and territory of the railroad. More importantly, FRA also proposes to require that a railroad's operating rules be based on the ability of friction brakes alone to safely stop the train under all operating conditions. Furthermore, FRA also proposes to require a railroad operating a train with a brake system that includes dynamic brakes to develop, implement, and make available to FRA upon request a plan to ensure that its locomotive engineers are fully trained in the operating rules prescribed above and at a minimum includes classroom, hands-on, and annual refresher training.

FRA views the establishment of these comprehensive operating rules and training plans as the most effective means by which to minimize the possibility of future incidents caused by excessive reliance on dynamic brakes by the train crew as a method of controlling the speed of a train in its descent through a difficult grade, as was the case in the San Bernardino incident. FRA views as unfortunate, and potentially reckless, the increasing number of train handling and power brake instructions issued by freight railroads that emphasize the use of dynamic brakes without including prominent warnings that such systems may not be relied upon to provide the margin of safety necessary to stop short of obstructions and control points or to avoid overspeed operation. Such instructions, while not yet affirmatively misleading to seasoned locomotive engineers, threaten to overcome the good judgement of safety critics and regulators by leading to excessive reliance upon these systems. Given the ever-increasing weight and length of freight trains, and the severe grades that they are often required to negotiate en route, the need for locomotive engineers who are thoroughly trained and knowledgeable in all aspects of train handling is paramount for continued safety in the rail industry.

In both the ANPRM (57 FR 62555) and the 1994 NPRM (59 FR 47687), FRA requested comments from the industry on possible methods of providing information regarding the status of dynamic brakes to the engineer in the cab of the controlling locomotive. The only workable option presented to FRA in the comments received was the equipping of locomotives with a dynamic brake display. Although FRA recognizes that the technology for dynamic brake displays with the ability to provide the type of information sought by FRA in the 1994 NPRM is not readily available today, several commenters suggested that it is currently being developed. Consequently, FRA is not ready or willing to require the use of such indicators at this time. However, FRA believes that the benefit of such an indicator would be to alert engineers that they have diminished or excessive dynamic capabilities, thus permitting the engineer to control the braking of their train in the safest possible manner. In order to fully evaluate the viability and potential use of dynamic brake indicators designed to test the electrical integrity of the dynamic brakes at rest and to display the available total train dynamic brake retarding force at each speed in 5-mph increments in the cab of the controlling locomotive, FRA again seeks comments from all interested parties regarding the following specific issues:

1. What is the status on the future availability of dynamic brake indicators

capable of providing the information discussed above?

2. What are the current cost estimates associated with the acquisition and installation of such indicators?

3. What quantitative and/or qualitative operational or safety benefits can be derived from the use of these dynamic brake indicators?

4. What alternative methods are available for providing the same information that a dynamic brake indicator would provide to a locomotive engineer?

V. Training and Qualifications of Personnel

Currently, the regulations contain no specific training requirements or standards for personnel who conduct brake system inspections. The regulations merely require that a ''qualified person'' perform certain inspections or tasks. *See* 49 CFR 232.12(a). Furthermore, the current regulations do not require that railroads maintain any type of records or information regarding the training or instruction it provides to its employees to ensure that they are capable of performing the brake inspections for which they are assigned responsibility. In several cases, FRA has found that a railroad's list of ''qualified persons'' is merely a roster of all of its operating and mechanical forces.

In the 1994 NPRM, FRA proposed a series of broad qualification standards addressing various type of personnel engaged in the inspection, testing, and maintenance of brake equipment. *See* 59 FR 47731–47732. These broad qualifications were separated into distinct subgroups which identified various types of personnel based on the type of work those individuals would be required to perform under the proposal. These included: supervisors; train crew members; mechanical inspectors; and electronic inspectors. Although not proposed in the rule text of the 1994 NPRM, the preamble contained various guidelines regarding specific hours of classroom and hands-on training as well as guidelines regard the level of experience each of these types of employees would be required to possess or be provided. *See* 59 FR 47702–47703. The proposal also contained various requirements regarding the development and retention of records and information used by a railroad in determining the qualifications of its employees. *See* 59 FR 47732.

FRA proposed these training and experience requirements and guidelines based on its belief that the current training provided to the individuals charged with performing brake maintenance, tests, and inspections should be greatly improved in order to ensure that train brake system maintenance, tests, and inspections are performed properly. During the technical workshops conducted in conjunction with the ANPRM, several labor organizations and their individual members explicitly commented that they are not sufficiently trained to perform the inspections and tests required of them. In addition, several railroads admitted that the training they currently provide could be improved. Although FRA recognized that many railroads were attempting to improve their training programs, FRA believed that minimum training qualifications needed to be established to assure that brake inspections and tests are being properly performed in order to protect both the public and railroad employees from the operation of equipment that does not meet Federal standards.

Several railroads responded to the 1994 NPRM contending that the specific guidelines contained in the preamble to the proposal, regarding years of experience as well as hours of classroom and ''hands-on'' training were unnecessary and overly broad. Many of these commenters believed that railroads were in the best position to determine the type of training that is necessary in any given circumstance based on the employee or employees involved. These commenters also indicated that many railroads are currently upgrading their training programs or already have training programs in place that could be fine tuned or slightly altered to provide sufficient training to its employees to accomplish the tasks for which they are assigned. Several commenters as well as the CAPUC recommended that it would be more appropriate for FRA to specify performance objectives rather than specific years of service or classroom hours. They believed that any training requirements should specify the training objectives and goals and refer to the employee's proficiency rather than the specific method used in reaching those objectives and proficiency. Several railroads also commented that an employee should only be required to receive training for those tasks which they are required to perform. Thus, an employee who performs only intermediate type brake inspections should not be required to receive training or instruction on the repair or maintenance of the equipment.

Although several labor organizations objected to some of the specific provisions contained in the preamble to the proposal, such as the potential for train crew personnel to be deemed a mechanical inspector and the recognition of the potential use of contract employees, these commenters did not dismiss the approach as unworkable. However, several labor representatives continue to contend that all brake and mechanical inspections must be performed by carmen, or similarly qualified individuals, and that train crew members are not and can never be adequately trained to properly perform these types of inspections. Some commenters suggested that FRA would not have to propose any qualification standards if it would simply require that all brake inspections and tests be performed by a carman.

Although the subject of employee training was a subject of concern during the RSAC Working Group deliberations, particularly as it relates to train crew members, there were no discussions which specifically addressed the training or knowledge that must be provided to employees responsible for conducting train brake inspections and tests. As noted in the above discussions, the Working Group discussions generally concentrated on instances when train crews would be permitted to perform and what distances such trains or cars could move after such inspections. However, it was clear that several railroad representatives on the Working Group believed better training needs to be provided to train crews to ensure the proper performance of quality brake inspections, particularly at initial terminals. Furthermore, all members of the Working Group appeared to recognize that a journeyman carman or other similarly trained individual possesses the knowledge and experience to conduct any of the required mechanical or brake inspections would be considered a qualified inspector without further training, with the exception of periodic refresher training.

FRA Conclusions. FRA has noticed continued improvement in the training provided by railroads to individuals charged with performing brake system inspections, tests, and maintenance; however, FRA continues to believe that this training could be greatly improved and enhanced. Although there has been a decline in the number of train incidents, derailments, fatalities, and injuries over the last ten years, FRA believes that the number of these incidents will be further reduced if maintenance, inspections, and tests of the brake system are performed by individuals who have received proper training specifically targeting the activities for which an individual is assigned responsibility. As stated previously, FRA believes one of the

major factors in ensuring the quality of brake inspections and the proper operation of that equipment is the adequate training of those persons responsible for inspecting and maintaining that equipment.

Railroads continue to consolidate mechanical work to fewer and fewer locations on the railroad. This trend places an increasing premium on the ability of train crews to conduct meaningful inspections and tests of the power brake system. Increases in train speeds and increased pressure on operating personnel due to growing traffic density will continue to make it critical for train crews and mechanical forces to discharge their duties with respect to power brake systems both diligently and effectively even under the most optimistic of scenarios with respect to the operation of incentives. FRA proposes to allow increases in the distances some trains may travel between brake system inspections where mechanical forces perform all of the inspection functions (including a complete inspection under 49 CFR part 215). The latitude that would be provided to some trains under this proposal would result in fewer inspections per distance traveled and reduce the number of opportunities that will exist for a serious defect to be found before it could result in a train incident. It is imperative, therefore, that each inspection be of uniformly high quality. Consequently, FRA believes that at a minimum broad, yet enforceable, performance-based training and qualification requirements for personnel charged with conducting brake system inspections, tests, and maintenance will help raise the overall quality of these activities.

Furthermore, as noted in the 1994 NPRM, technological change presents an additional reason for placing strong emphasis on qualifications of inspection personnel. Train crew and mechanical personnel alike are confronted with an increasing variety of power brake arrangements and features. The AAR has been intensifying its effort to develop and deploy electronic braking systems on freight equipment. This trend will make it important for personnel to be fully familiar with the systems that they are required to inspect and maintain. FRA recognizes that although technological advancements may increase the need for more qualified maintenance forces, they may also reduce the complexity and extent of the inspecting and testing requirements for certain equipment with the emergence of brake indicators and sensors or the development of more reliable equipment.

Consequently, FRA proposes broad performance-based training and qualification requirements which permit railroads to develop programs specifically tailored to the type of equipment it operates and the employees designated by the railroad to perform the inspection, testing, and maintenance duties required in this proposal. FRA tends to agree with several railroad commenters that there is no reason for individuals who solely perform pre-departure air brake tests and inspections to be as highly trained as a carman since carmen perform many other duties which involve the maintenance and repair of equipment in addition to brake inspections. Therefore, the proposed training and qualification requirements permit railroads to tailor their training programs to ensure the capability of its employees to perform the tasks for which they are assigned. FRA intends for the proposed training and qualification requirements to apply not only to railroad personnel but also to contract personnel and personnel in plants that build cars and locomotives that are responsible for brake system inspections, maintenance, or tests.

Contrary to the 1994 NPRM, FRA does not intend to issue specific experience, classroom training, or ''hands-on'' training guidelines. FRA agrees that many of the guidelines contained in the preamble to that proposal were overly restrictive and may have impeded the implementation of certain training protocols capable of achieving similar results with less emphasis on solely the time spent in the training process. Furthermore, the proposed guidelines failed to consider the potentially narrow scope of training that might be required for some employees, particularly some train crew personnel, that perform very limited inspection functions on very limited types of equipment. Consequently, although the training and qualification requirements currently proposed continue to require that any training provided include classroom and ''hands-on'' training as well as verbal or written examinations and ''hands-on'' proficiency, they do not mandate a specific number of hours that this training must encompass as that will vary depending on the employee or employees involved, which is probably best determined by the railroad. The proposed requirements also contain provisions for conducting periodic refresher training and supervisor oversight of an employee's performance once training is provided.

FRA believes that the recordkeeping and notification requirements contained in this proposal are the cornerstone of the training and qualification provisions. As FRA is not proposing specific training curriculums or specific experience thresholds, FRA believes that these recordkeeping provisions are vital in ensuring that proper training is being provided to railroad personnel. FRA believes these requirements provide the means by which FRA will judge the effectiveness and appropriateness of a railroad's training and qualification program. These provisions also provide FRA with the ability to independently assess whether the training provided to a specific individual adequately addresses the tasks for which the individual is deemed capable of performing and will most likely prevent potential abuses by railroads to use insufficiently trained individuals to perform the necessary inspections, tests, and maintenance required by this proposal. FRA proposes to require that railroads maintain specific personnel qualification records for all personnel (including contract personnel) responsible for the inspection, testing, and maintenance of train brake systems. FRA proposes that these records contain detailed information regarding the training provided as well as detailed information on the types of equipment the individual is qualified to inspect, test, or maintain and the duties the individual is qualified to perform. Most Class I and larger Class II railroads already keep records of this type; however, they are not always easily obtained by FRA. As an additional means of ensuring that only properly qualified individuals are performing only those tasks for which they are qualified, FRA proposes to require that railroads promptly notify personnel of changes in their qualification status and specifically identify the date that the employee's qualification ends unless refresher training is provided.

FRA recognizes that some railroads will be forced to place a greater emphasis on training and qualifications than they have in the past, and this requirement will result in additional costs for those railroads. However, the proposed rule allows the railroads the flexibility that they need to provide only that training which an employee needs for a specific job. The proposed rule does not require an employee who only performs brake inspections while en route (i.e., Class II brake tests) to receive the intensive training needed for an employee who performs Class I brake tests or one who is charged with the maintenance or repair of the equipment. The training can be tailored to the specific needs of the railroad. Across the industry as a whole, this proposal will

not require extensive changes in the way most railroads currently operate, but it will require some railroads to invest more time in the training of their personnel and should prevent railroads from using minimally trained and unqualified people to perform crucial safety tasks.

FRA recognizes that the costs of the proposed training requirements are fairly substantial, however, FRA believes that most Class I railroads have already invested in training, routinely schedule training for their employees, and offer training to other interested parties. For example, the Union Pacific, Southern Pacific, CSX Transportation, and Norfolk Southern and all other Class I railroads have a training department, have training staff available, and have the knowledge to complete this proposed requirement. However, it is unlikely that Class I railroads have identified each task or the steps necessary to complete each task of inspection, testing, and maintenance of each type of freight car they operate. Furthermore, most railroads do not engage in the ''hands-on'' training and testing contained in this proposal nor do most railroads maintain the records required in this proposal. It should be noted that many Class I railroads have participated in a Safety Assurance and Compliance Program (SACP) with FRA and labor. Most of the SACP's have required additional training by the participating railroads. Many of the proposed training requirements would already be met by those railroads that have completed the training required under the SACP.

Short line railroads, particularly Class II railroads may send employees to other railroads for training, participate in ASLRA and FRA training, and have on-the job training. Class III railroads are less likely to send employees to other railroads for training, most of the training would be on-the-job training, training by FRA, or through ASLRA programs. Typically on-the-job training on these smaller railroads involves having their employees work with a more experienced employee or an individual who may have been previously employed by a Class 1 railroad and received formal training with that railroad. Furthermore, Class III railroad employees are not likely to require extensive training on different types of brake equipment since most of the equipment used by Class III railroads have only one type of brake valve. Furthermore, the employees of these small railroads would likely not be required to receive any training in the areas of EPIC brakes, dynamic brakes, two-way EOT devices, or on some of the brake tests and maintenance mandated in the proposal due to the limited distances traveled by these trains, the low tonnages hauled, and because many of the maintenance functions are contracted out to larger railroads.

Although FRA is proposing broad performance-based training requirements rather than specific experience, classroom training, or ''hands-on training guidelines, FRA expects that railroads will incur a significant cost to comply with the requirements contained in this proposal. Training related costs have been identified as the most significant cost item contained in this proposal, accounting for nearly $77 million dollars of the approximate $98 million cost of this proposal. *See* Regulatory Impact Analysis and Regulatory Impact discussion below. However, virtually all of the safety related benefits, conservatively estimated at over $31 million, for this proposal are derived from the increase and improvement in the training of railroad personnel, which FRA believes will result in the reduction and prevention of accidents and the resulting fatalities, injuries, and property damage. There are also a number of unquantifiable safety and economic benefits which will be derived from the prevention of accidents such as: associated accident clean-up costs, evacuation and medical costs, road closures, and the environmental damage caused by hazardous materials releases. It should be noted that FRA also believes that there will be a significant unquantifiable operational benefit derived from the enhanced training of railroad personnel, particularly in the areas of increased equipment utilization, reduced train delays, repair costs, and debris removal. In order to further assess both the cost and benefits as well as other impacts the proposed training and qualification requirements will have, particularly on smaller railroads, FRA requests comments from interested parties on the following:

1. What is the potential impact of the proposed training and qualification requirements on short line railroads (i.e., Class II and Class III railroads)? How will these types of railroads meet the proposed requirements?

2. What is the potential impact of the proposed recordkeeping requirements to smaller railroads (i.e., Class III railroads)? Do these railroads currently maintain some sort of training records?

3. As FRA believes these records are a key element of the proposed training and qualification requirements, are there alternative methods available to smaller railroads (i.e., Class III railroads) for maintaining and developing the required information?

4. Currently, what percentage of employees will require additional training?

5. Are there a sufficient number of ''qualified'' employees at present to ensure that no operational difficulty will result? If not, what is a reasonable timeline for permitting railroads (particularly smaller railroads) to reach full compliance with regard to these requirements?

VI. Air Source Requirements

In the ANPRM, FRA provided background information and presented questions on the issue of requiring additional testing of train air brakes in extremely cold weather, especially in mountainous territory. *See* 57 FR 62552. Though it is acknowledged that cold temperatures may affect the train air brake system in many ways, the freezing of moisture that has accumulated in the trainline which potentially causes blockages or restrictions in air flow in the brake pipe and reduces braking effort is an obvious and major concern. As a means to combat this dangerous combination of factors that could lead to a loss of or a reduction in braking effort, the industry has historically utilized methanol and other alcohols in the trainline to act as an anti-freeze during these cold weather operations. However, based on FRA experience and the statements of several commenters, it is evident that the use of these chemicals in the trainline causes untimely wear and tear to brake system components and has a long-term detrimental effect on train air brakes. Comments provided to FRA indicated that air dryers on locomotives are very effective in improving the performance of train brake systems, particularly under cold weather conditions, and generally eliminate the need to use alcohol and other foreign substances in the trainline. Several railroads commented that they have already equipped their locomotives with air dryers in order to curb the use of chemicals in the trainline. Furthermore, several railroads frequently operating under extreme cold weather conditions commented that they have prohibited chemicals from being placed in brake air systems to prevent freeze-up. These railroads stated that they have been able to operate trains in cold weather without resorting to chemicals, such as alcohol.

Based on these comments and experiences, FRA proposed in the 1994 NPRM to ban the use of anti-freeze chemicals in train air brake systems. *See* 59 FR 47728. In addition, FRA proposed

that all new and rebuilt locomotives and all yard air sources be equipped with air dryers capable of achieving a 30 °F air dew point depression at a 100 cfm air flow rate, unless the new or rebuilt locomotive would not be operated in cold weather conditions, would power only trains limited to 30 mph or less, or would power only trains of 20 cars or less. FRA believed that an exception from the proposed requirements for these types of operations was warranted based on the comments received and on FRA's experience that moisture in the brake line in these types of operations has never been a problem.

Many railroads commented that the proposed requirements for air dryers would be costly and ineffective if implemented. These commenters cited testimony provided by Canadian railroads, operating in extreme cold weather conditions, which indicated that none of their locomotives are currently equipped with air dryers, yet they have not experienced problems with frozen brake lines. Additional comments provided by Canadian railroads maintained that their experience shows that the prevention of brake pipe freeze-up is not a direct benefit of equipping air sources with air dryers. These commenters stated that freezing of the brake pipe is of much less concern when trains are operated with two-way end-of-train devices, in that any restriction or blockage in the brake pipe will be recognized and appropriate steps will be taken to stop the train safely. Commenters noted that the majority of railroads have adopted operating rules which prohibit the use of chemicals in the trainline as proposed in the NPRM. A supplier of air brake equipment commented that in order for air dryers to be effective, the temperature of the air going into the dryers must be controlled. This would typically be accomplished through equipping the air source with an aftercooler to get the input air to within 20 degrees of the ambient temperature. Railroad commenters supported the use of aftercoolers as advocated by this supplier representative, acknowledging that locomotives equipped with aftercoolers help reduce the relative humidity, ensuring moisture will not precipitate. These commenters noted that experience has shown aftercoolers to be much cheaper to install and maintain when compared to air dryers.

At the initial meeting of the full Power Brake Working Group, members discussed the broad topic area of ''Design Requirements—Locomotive Standards.'' The issue of air dryers on locomotives, and also on yard/ground air sources, was included in this discussion. Several members of the Working Group suggested that any requirements for air dryer or similar technology be expressed in terms of a performance standard for air dryness, and that such a standard should be developed by a separate task force. Consequently, a task force was formed and was comprised of representatives from FRA, labor, management, and suppliers (through the participation of the RPI). The Working Group articulated the task of this subgroup as follows: (1) Determine how dry the air should be, and subsequently, (2) what technology/hardware exists and is available to achieve these prescribed levels. The task force was also directed to consider and evaluate any economic implications that may impact prospective air dryer requirements.

At the second meeting of the full Working Group, members of the task force presented a general discussion of the basic principles of air and the amount of water contained in air. This discussion provided detailed information regarding the weight or amount of water contained in air, the effect of water condensation when air pressure is increased, how temperature affects water condensation, and the quantity of air required to charge a train. Several methodologies and technologies capable of drying air and preventing condensation were described and discussed, including broad economic considerations associated with each. Several members of the Working Group noted that the discussions had centered predominately on locomotives, and that more information was needed regarding ground/yard air sources such as those used to charge the trainline prior to the addition of locomotives. These members indicated that they felt ground/yard air plants used in this capacity are the major cause of moisture in a train.

Members of the task force addressed the issue of ''dew point depression'' in detail, defining dew point depression as the temperature reduction below ambient conditions at which moisture begins to form, describing how it is calculated, and identifying specifications utilized by other industries when considering dew point depression parameters. As the Working Group had emphasized their preference that any requirements developed for dry air be based on a performance-type standard, the group quickly focused task force efforts toward the development of a specific numerical value of dew point depression that would minimize the possibility of water being introduced into the brake system. One member of the task force recommended, based on information that had been presented and practical field experience, that a dew point depression of $-6°$ to $-10°$ Fahrenheit would be sufficient to prevent the development of condensation in train operations. This member noted that aftercoolers alone can achieve this level of dew point depression, and could be utilized in conjunction with air dryers to produce even lower levels. It is important to note that these conclusions and recommendations were made by one member of the task force, and did not represent consensus conclusions or recommendations of the task force. Numerous concerns were raised regarding the technical rationale employed in formulating this ''acceptable range'' of temperatures, and several members voiced apprehension regarding FRA's ability to effectively and uniformly enforce such a requirement, should it be imposed.

Extended discussions ensued regarding the establishment of a performance standard for dry air which would serve to eliminate or minimize the introduction of moisture into the train brake system, using dew point depression as the defining parameter. The Working Group members were unwilling to unanimously and fully endorse the $-6°$ to $-10°$ Fahrenheit temperature range proposed by the task force leader given the lack of detailed, documented, and substantiated test data to support this conclusion. Noting that fact finding and data development are the major functions of a task force under the stated guiding principles of the RSAC process, the Working Group directed the task force to study, through instrumented testing, the appropriate value of dew point depression that is required to ensure safe operations for both locomotives and yard/ground air systems.

In an effort to gather field data to either confirm the proposed parameters or to develop alternative measures, task force members visited two train yards and gathered data using a device specifically designed to measure dew points. The task force performed tests on numerous locomotives and yard air plants, with and without air dryers, to determine the amount of dew point depression in the air lines. The results of these tests confirmed the assumptions of the Working Group members in that the vast majority of locomotives did not contribute to moisture in the train air lines, but rather, the main source of raw water came from yard charging units. Further, the majority of the yard units which were tested were relatively old and had not been properly maintained or upgraded in years. During the task force tests, it was noted that all units

equipped with air dryers produced minimal moisture in the system. Based on these results, some member of the task force believed that both yard charging units and locomotives be equipped with a device which would assist in the reduction of moisture in the train air lines. Since a large number of trains are charged by yard air sources (up to 80 percent by some estimations), it appeared that yard air charging units should be given the greatest priority. Several members of the task force suggested that all yard air sources be equipped with a device which will produce a minimum dew point depression of −25 °F and similarly equip locomotives to produce a minimum dew point depression of −8 °F. This was not a consensus recommendation from the task force, as some members of the task force felt that the issue of moisture in the trainline is not a safety issue, but more appropriately an item addressed through improved maintenance procedures. In addition, these members firmly believed that the installation of air dryers as proposed was cost prohibitive given the limited safety benefit to be realized, and that the task force had not adequately addressed the economic implications of requiring locomotives and yard air units to meet the recommendations as forwarded to the Working Group.

FRA Conclusions. FRA intends to ban the use of anti-freeze chemicals in train air brake systems, reiterating the position stated in the 1994 NPRM, in order to prevent the untimely damage and wear to the brake system components. *See* 59 FR 47728. FRA did not receive any adverse comments on this issue in response to the 1994 NPRM, and based on the statements and considerations raised in various Working Group meetings it appears that both rail labor and management representatives believe that such a provision would be acceptable.

Based on information gathered throughout the RSAC process, previous comments by industry parties, and agency experience, FRA firmly believes that the presence of moisture in the train air brake system poses potential safety, operational, and maintenance issues that require attention in this rulemaking. After completion of detailed, instrumented testing on both locomotives and yard test plants performed as part of the task force activities, FRA tends to believe that locomotives rarely contribute to moisture in the trainline. As such, FRA is not proposing that air dryers be installed on new locomotives, as was proposed in the 1994 NPRM (59 FR 47729).

The results of this same testing clearly indicated that yard air plants often provide unacceptably high levels of moisture while charging the train air brake system due to the age of the system, improper design, inadequate maintenance, or a combination thereof. Task force efforts also estimated that upwards of 80 percent of train air brake systems are charged using yard/ground air plants. However, FRA believes that simply requiring that yard air sources be equipped with air dryers may not alone necessarily effectuate the desired results unless the air dryers are appropriately placed to sufficiently condition the air source. Many yard air sources are configured such that a single air compressor services several branch lines used to charge train air brake systems, and as such, multiple air dryers may be required to eliminate the introduction of wet air into the brake system. FRA believes that, as with locomotives, requiring yard air sources to be equipped with air dryers will likely impose a significant and unnecessary cost burden on the railroads.

Based on the above discussion, FRA is proposing that each railroad develop and implement a system by which they monitor all yard air sources to ensure that they operate as intended and do not introduce contaminates into the brake system. FRA believes that implementation of this monitoring program as proposed represents a method by which the industry can truly maximize the benefits to be realized through air dryer technology, which all parties acknowledge has been proven to reduce the level of moisture introduced into the trainline, at a cost that is commensurate with the subsequent benefits. This proposed program requires a railroad to take remedial action with respect to any yard air sources that are found not to be operating as intended, and further proposes to establish a retention requirement with respect to records of these deficient units to facilitate the tracking and resolution of continuing problem areas. Further, FRA believes that yard air reservoirs should either be equipped with an operable automatic drain system or be manually drained at least once each day that the devices are used or when moisture is detected in the system. FRA believes that these provisions, in concert with assurances that condensation is blown from the pipe or hose from which compressed air is taken prior to connecting the yard air line or motive power to the train as currently prescribed in § 232.11(d), will minimize the possibility of moisture being introduced into the train air brake system.

It should be noted that FRA recently published a final rule mandating the incorporation of two-way end-of-train telemetry devices (two-way EOTs) on a variety of freight trains, specifically those operating at speeds of 30 mph or greater or in heavy grade territories. *See* 62 FR 278. Two-way EOTs provide locomotive engineers with the capability of initiating an emergency brake application that commences at the rear of the train in the event of a blockage or separation in the train's brake pipe that would prevent the pneumatic transmission of the emergency brake application throughout the entire train. These devices consist of a front unit, located in the cab of the controlling locomotive, and a rear unit, located in the rear of the train and attached to the brake pipe. Radio communication between the front and rear end units is continually monitored and confirmed at regular intervals, and the rear unit is only activated when continuity of these radio transmissions is not maintained over a specified time interval. This discussion of two-way EOTs is particularly appropriate within the context of the air source requirements and air dryers. In the unlikely event that the proposed requirements regarding air dryers fail to sufficiently eliminate moisture from the trainline, and a restriction or obstruction in the form of ice forms as the result of the freezing of this moisture during cold weather operations, the two-way EOT device becomes a first order safety device and will initiate an emergency application of the brakes from the rear of train. As such, the vast majority of concerns associated with moisture in the trainline freezing in cold weather operations have been alleviated through the incorporation of this technology in most freight operations.

In an effort to further develop and evaluate this proposal, FRA seeks comments from all interested parties regarding the following specific issues:

(1) How many yard sources are there that are used to charge train air brake systems?

(2) What time period will be required to effectively institute the monitoring program as prescribed?

(3) How many of these yard air sources are equipped with automatic drain valves?

(4) If the yard air source is not equipped with an automatic drain valve, how long does it take to drain manually?

VII. Maintenance Requirements

In the ANPRM, FRA solicited comments from interested parties regarding the elimination of cleaning, oiling, testing, and stencilling (COT&S) requirements for freight brake valves as a result of the AAR's adoption of enhanced single car and repair track air brake testing requirements in 1990. *See* 57 FR 62556. In response, all industry representatives, including rail management, labor, and suppliers, acknowledged that the improved single car test constituted a significant improvement over the previous time-based COT&S requirements in detecting and eliminating defective brake equipment and components. However, labor representatives contended that the railroads are circumventing the use of the new procedures by eliminating repair tracks all over the nation in order to avoid performing these single car tests. Several individuals presented examples of how the single car test and repair track test are being circumvented, such as making repairs in the field or moving cars to expediter tracks for repairs rather than to repair tracks. Therefore, these commenters recommended that some type of in-date testing or attention must be reinstated. The RLEA also recommended that periodic attention be reinstated, contending that acceptance of AAR's unilateral change in the maintenance requirements allows the AAR to unilaterally establish regulations without public comment. Labor representatives forwarded similar recommendations, stating that any changes made by the AAR in their recommended maintenance practices should be reviewed and approved by the FRA.

Based on the comments received, FRA agreed that the new single car test established a better and more comprehensive method of detecting and eliminating defective brake equipment and components, but further agreed that cars must receive the test in order to fully benefit from the advantages of the enhanced single car test. Accordingly, in the 1994 NPRM, FRA proposed to require the single car or repair track test be conducted on any car that is on a repair or shop track for various wheel or brake equipment defects, and that at a minimum, freight service equipment should receive the test every one or two years depending on whether the equipment is high-utilization or non-high-utilization equipment (as defined in the 1994 NPRM). *See* 59 FR 47741. FRA did not feel that requiring the performance of the repair track or single car test at the proposed time periods would be overly burdensome on the industry since, according to studies conducted by the AAR showing that a car is typically on the repair track 1.7 times a year, most cars will be on a repair or shop track within the proposed time limits. The proposal further allowed parties to request a change in the time interval for performing the single car test by monitoring their single car tests and conducting a statistical analysis of the results. In order to ensure that the single car tests are properly performed, FRA proposed that only qualified brake system inspectors should conduct the tests and that the single car testing devices should be tested at least once a day and receive maintenance at least every 92 days. Furthermore, in order to ensure proper maintenance of brake equipment, FRA proposed that each railroad should develop and enforce written maintenance procedures for all types of brake systems it operates which meet or exceed current industry standards and all federal train brake system safety requirements. The maintenance required by these proposed procedures would be performed only by individuals qualified as mechanical or electronic brake system inspectors as designated in other sections of the 1994 NPRM. Spot checks of both the single car tests and the maintenance procedures would be conducted by qualified supervisory personnel to ensure the procedures are being followed and the tests are properly performed.

In response to the 1994 NPRM, many railroads commented that car utilization would be significantly decreased if the proposed requirements were adopted. These commenters felt that this decline would be directly attributable to the proposed requirements regarding craft-specific designation for the conduct of the single car tests, periodic intervals for conduct of the tests that were viewed as overly burdensome, and stencilling requirements that were viewed as similarly burdensome and costly. Labor organizations countered, reiterating their comments provided in response to the ANPRM regarding a perception that the carriers are directly circumventing the single car and repair track test by moving cars to expediter tracks for repairs rather than to repair tracks, or simply by making repairs in the field. Therefore, these labor organizations strongly advocated that FRA require and enforce periodic testing and inspection to ensure the continued safety of both railroad employees and the general public through realization of brake equipment that will be in better and safer condition as a result.

At the initial meeting of the Freight Power Brake Working Group, the specific issues of periodic maintenance and single car test requirements were identified as topics best addressed through formation of a separate task force. Thus, a task force was created and was charged with assembling and analyzing existing data pertaining to single car and repair track testing, and formulating appropriate recommendations based on an evaluation of this data. This task force was comprised of representatives from rail management, labor, and FRA. Task force deliberations commenced with a review of recent changes incorporated by the AAR with regard to single car and repair track test procedures, and a presentation of related data and statistics showing the direct benefits realized as a result of these revised procedures in terms of the number of defective brake system components detected and repaired. However, several members of the task force voiced strong objections regarding the accuracy and credibility of the data accumulated in the development of the presentation material. Beyond a fundamental questioning of the accuracy and credibility of this data, the group identified specific issues of concern to include incorrect data reported from the field, brake tests performed on defective cars, problems with accessibility to the AAR's UMLER reporting system, and questions regarding the service life of brake valves as reported.

The task force related their reservations regarding reliability of the available data to the Working Group, specifically with respect to the manner in which it has been collected and analysed, and requested clarification regarding the definition of their specific assignment. Extensive discussions ensued regarding the source and accuracy of data that had been presented by each the FRA, AAR, and labor. Working Group members conceded that each respective database was likely biased to some extent due to variances in the way inspections are conducted and alternative methodologies used in collecting and evaluating the resulting data. Several members felt that FRA's database does not accurately reflect defect ratios since railroads are permitted to repair defects prior to the FRA taking exceptions, and others suggested that FRA's data is skewed toward problem areas, and that more random and unbiased data is necessary to formulate an accurate portrayal of the current state of the industry. Given the divergent views on the existing data, several members of the

Working Group suggested that the group consider the purposes for which the data is needed, and whether it is needed at all. The group agreed that a uniform understanding of the data and its relevance by all parties was necessary to validate current practices, and that there is great difficulty in detecting a systematic problem with the existing methodologies unless data is collected.

The task force elected to continue discussions regarding the applicability and content of AAR's Rule 3, Chart A, which prescribes tests and attention required per AAR Specification S–486 (Code of Air Brake System Tests for Freight Equipment). In doing so, the Working Group instructed the task force to consider the extent to which an industry rule such as AAR's Rule 3, and specifically, Chart A, could be incorporated into a Federal regulation, and the necessary restrictions associated with publication date and subsequent changes that would need to be addressed. The task force continued its exhaustive review of AAR's Rule 3, Chart A, and made significant progress in reaching full consensus on the provisions contained therein. However, as the broad issues under consideration by this task force were directly tied to acceptance of the available data, continued progress was significantly impeded by the inability of the Inspection and Testing task force to reach resolution of what developed as a core issue of the working group proceeding in general; namely, data validity and reliability. Nonetheless, the task force continued efforts to evaluate the effectiveness of the AAR's UMLER reporting system, and examined possible modifications that would facilitate tracking maintenance and testing of equipment via this system as opposed to stencilling. Members of the task force also visited three facilities to view their approaches to periodic maintenance, single car testing, and repair track air tests. Ultimately, this task force was unable to provide consensus recommendations to the Working Group regarding periodic maintenance and testing requirements due to the Working Group members' collective unwillingness to agree on the issues relating to data collection, evaluation, and relevance as discussed in detail above.

FRA Conclusions. Based on comments received in response to the 1994 NPRM, deliberations of the Working Group and task force, and field experience, FRA remains confident that the ''new'' repair track and single car test, which have been used industry-wide since January of 1992, are a much better and more comprehensive method of detecting and eliminating defective brake equipment and components than the old, time-based COT&S requirements. FRA believes that performance of the single car test significantly reduces the number of defective components and dramatically increases the reliability of brake equipment. Accordingly, FRA proposes to incorporate AAR Interchange Rule 3 and Chart A into this regulation, thus codifying the repair track air test requirements per Chart A such that a railroad is required to perform a repair track brake test on freight cars when: (i) A freight car is removed from a train due to an air brake related defect; (ii) a freight car has its brakes cut-out when removed from a train or when placed on a shop or repair track; (iii) a freight car is on a repair or shop track for any reason and has not received a repair track brake test within the previous 12 month period; (iv) a freight car is found with missing or incomplete repair track brake test information; (v) the brake reservoir(s), the control valve mounting gasket, and the pipe bracket stud is removed, repaired, or replaced; or (vi) a freight car is found with a wheel with built-up tread, slid flat, or thermally cracked. Further, FRA proposes that each freight car shall receive a repair track air test no less frequently than every 5 years, and not less than 8 years from the date the car was built or rebuilt. Similarly, the single car test requirements of Chart A will be codified such that a railroad will perform a single car test on a freight car when one or more of the service portion, the emergency portion, or the pipe bracket is removed, repaired, or replaced.

FRA recognizes that circumstances arise such that required repair track brake tests or single car tests cannot always be performed at the point where repairs can be made. In these instances, FRA proposes to allow a car, after repairs are effectuated, to be moved to the next forward location where the test can be performed. FRA intends to make clear that the inability to perform a repair track brake test or a single car test does not constitute an inability to effectuate the necessary repairs. At the same time, however, FRA recognizes rail labor's contention that some carriers often attempt to circumvent the requirements for single car and repair track testing through the elimination of repair tracks, by moving cars to expediter tracks for repair, or simply by making the repairs in the field. As a means to curtail these practices, FRA proposes to impose extensive tagging requirements on freight cars which, due to the nature of the defective condition(s) detected, require a repair track brake test or single car test but which are moved from the location where repairs are performed prior to receiving the required test. As an alternative to the tagging requirements, FRA proposes to permit a railroad to utilize an automated tracking system to monitor these cars and ensure they receive the requisite tests provided the automated system is approved by FRA. FRA also proposes to require stencilling requirements regarding the location and date of the last repair track or single car test. Alternatively, FRA intends to permit railroads to utilize an electronic record keeping system to accomplish this tracking requirement, provided such a system is approved by FRA. FRA believes these requirements are necessary to ensure the timely performance of these important tests. Without such information, there would be virtually no way for FRA to verify a railroad's compliance with the proposed repair track and single car test requirements.

As in the 1994 NPRM, FRA continues to believe that single car testing devices should be tested at least once a day and receive routine maintenance at least every 92 days. Additionally, FRA feels that mechanical and electronic test devices should be regularly calibrated. FRA received no comments objecting to these requirements when previously proposed.

FRA agrees that any changes to the AAR standards incorporated into regulation should be reviewed and approved by all affected parties, including FRA and rail labor. Consequently, FRA proposes to implement a Special Approval process, whereby the AAR will be required to submit any proposed changes to the FRA. FRA will review the proposed change to determine whether the change is ''safety-critical,'' to include, but not limited to (i) any changes to Chart A, (ii) changes to established maintenance intervals, and (iii) changes to UMLER reporting requirements. If the proposed change is deemed by FRA to be ''non safety-critical,'' FRA will permit the change to be implemented immediately. If the proposed change is deemed ''safety-critical,'' FRA proposes to publish a **Federal Register** Notice, conduct a Public Hearing if necessary, and act based on the information developed and submitted in regard to these proceedings.

FRA proposes development of this Special Approval process in response to comments from several railroads and manufacturers, both in response to the 1994 NPRM and at the RSAC Working Group meetings, that FRA needed to

devise some sort of quick approval process in order to permit the industry to make modifications to existing standards or equipment based on the development of new technology. Thus, FRA has attempted to propose an approval process it believes should speed the process for taking advantage of new technologies over that which is currently available under the waiver process. However, in order to provide an opportunity for all interested parties to provide input for use by FRA in its decision-making process as required by the Administrative Procedure Act, FRA believes that any special approval provision must, at a minimum, provide proper notice to the public of any significant change or action being considered by the agency with regard to existing regulations.

VIII. Two-way End-of-Train Devices

On January 2, 1997, FRA issued a final rule which contained design, performance, and testing requirements relating to end-of-train devices (EOTs), which became effective for all railroads on July 1, 1997, except for those for which the effective date was extended to December 1, 1997 by notice issued on June 4, 1997. *See* 62 FR 278 and 62 FR 30461. FRA intends to incorporate the provisions contained in that final rule into this proposal. As the provisions contained in that rule were just recently issued, there is little need to discuss these requirements in detail as they were fully discussed in the publications noted above. However, since their issuance, FRA has discovered that a few of the provisions are in need of minor modification for clarification purposes and to address some valid concerns that have been raised both internally by FRA inspectors and by outside parties. Consequently, FRA intends to propose a few specific modifications to the currently effective requirements which are discussed in detail in the ''Section-by-Section'' portion of this preamble regarding Subpart E of this part.

Although FRA is proposing only a few specific changes to the current two-way EOT requirements, the following discussion details several issues which have arisen since the issuance of the final rule on EOTs. FRA seeks comment and information from all interested parties related to the issues discussed below in order to potentially take appropriate action on these issues at the final rule stage of this proceeding.

The first issue of concern involves the ability of a railroad to test the ability of the devices to initiate an emergency brake application via a bench test. In the final rule, FRA elected to permit railroads some flexibility in determining that a device is capable of initiating an emergency brake application. Thus, FRA included a broad performance requirement and then discussed various methods of complying with the requirement in the preamble to the rule, one of which permitted a bench test of the devices. *See* 62 FR 287, 290, and 295. Based on information and questions received by FRA, it is obvious that the bench testing option needs further clarification. The reason FRA requires that the devices be tested at the initial terminal or other point of installation is to ensure that the front unit will transmit an emergency brake application signal to the rear device and that the rear device is capable of initiating an emergency brake application from the rear of the train. Thus, the test must include a testing of both the front and rear units (devices) that will be used on a train. The bench test allows railroads to perform the above test in a shop environment that may be more conducive to finding problems with the devices and making appropriate repairs as well as permitting railroads some efficiency in performing the test.

In order to clarify what is required when a railroad performs a bench test, FRA issued guidance to its inspectors on July 28, 1997. *See* Technical Bulletin MP&E 97–8. In this guidance FRA made clear that a bench test could be performed on both the front and rear units, independent of each other, as long as the test is performed within the yard limits or location where the device will be installed on the train. In FRA's view, bench testing the rear unit requires applying air pressure to the device and then transmitting an emergency brake application from a front unit using the front unit manual switch. The individual performing the test would determine the emergency valve functions properly by either observing the emergency indicator pop out or observing brake pipe pressure at the rear device go to zero while hearing the exhaust of air from the device. Whereas, bench testing the front unit would entail transmitting an emergency brake application from the front unit, using the front unit manual switch, and observing that a rear device successfully receives the signal and activates the emergency air valve.

FRA further believes that both tests must be performed within a reasonable time period prior to the device being armed and placed on the train. To determine a reasonable time period, the environment where the device is stored and the conditions the device is subjected to after completing a successful bench test have to be considered. If the devices are tested and stored in a controlled environment that is free from weather elements, excessive dust, grease, and dirt prior to the immediate installation on a train, then 4–8 hours would be acceptable. If the devices are tested and haphazardly thrown into a corner of a shop or are placed in the rear of a truck to be bounced around a yard, 1 hour would likely be considered reasonable before installation. FRA also made clear that bench tests must be performed at the location or yard where the device will be installed on a train.

To further develop the details of this issue, FRA seeks comments from all interested parties on the following:

1. What procedures do railroads currently have in place regarding the performance of bench tests on two-way EOTs?

2. How many railroads currently conduct bench testing of these devices? What number of devices are tested in this manner?

3. As noted above, FRA believes that 8 hours is about the maximum time limit that should be permitted between the performance of a bench test and the installation of a device on a train. Is this reasonable?

4. Should FRA specifically include provisions regarding the performance of a bench test in the regulations?

Another subset of issues that has arisen regarding two-way devices, is the requirements related to handling trains on heavy grades. The two most prevalent issues involve the actions that must be taken when the devices fail en route on a heavy grade and situations where a train must be separated in order to traverse a grade. FRA does not intend for engineers to place themselves in an unsafe situation when they encounter an en route failure of the device when traversing a heavy grade. Although the rule prohibits the operation of a train over certain heavy grades when a failure of the device occurs en route, FRA did not intend that the train be immediately stopped when a failure of the device occurs while operating on a heavy grade. Rather, FRA intends for the locomotive engineer to conduct the movement in accordance with the railroad's operating rules for bringing the train safely to a stop at the first available location. Therefore, safety may require that the train continue down the grade or to a specific siding rather than to an immediate halt. Consequently, FRA expects railroads to develop appropriate procedures and train their engineers on those procedures related to the handling of trains on heavy grades when a two-way EOT fails during heavy grade operation.

A second issue related to heavy grades involves situations where a train must be divided in two in order to traverse a particularly heavy grade due to the lack of sufficient motive power to haul the entire train up the grade. This practice is referred to in the industry as ''doubling a hill.'' Initially, FRA felt that the two-way EOT should be connected to that portion of the train traversing the grade. However, such an approach creates a multitude of operational as well as safety concerns. Such an approach would require train crews to repeatedly switch the rear unit from one portion of the train to another, which would require these individuals to repeatedly walk sections of the train at locations where it may not be safe to do so. Alternatively, such an approach might require some trains to carry extra devices while in transit. Both options tend to compromise the proper operation of the rear devices. Consequently, FRA is seeking information and suggestions on how to handle these types of situations that most effectively deal with all of the safety hazards involved in these types of operations.

In order to further develop the two issues discussed above, FRA seeks comment and information from all interested parties on the following:

1. What procedures do railroads currently have in place concerning the handling of a train that experiences a failure of the two-way EOT while operating on a heavy grade?

2. Should trains be permitted to continue down a heavy grade if a failure of the two-way EOT occurs while descending the grade? For what distance or to what type of location?

3. How many railroads currently engage in the practice of having trains ''double a hill?'' How many trains engage in this activity? At what locations?

4. Are there helper locomotives stationed near the locations where trains engage in the practice of ''doubling a hill?'

5. Is safety better served by permitting railroads to leave the rear unit on the rear of the train and proceeding with the front section of the train over the grade? What safety hazards are created by permitting such operation? Are there operational restrictions that could be imposed to limit the potential safety hazards?

Section-by-section analysis

Amendments to 49 CFR Part 229

The amendments to part 229 contained in this proposal principally concern the testing of electronic gauges commonly used in electronically controlled locomotive brake systems. Currently, there are two electronically controlled locomotive brake systems in use on the nation's railroads, the Electro-Pneumatic Integrated Control (EPIC) system supplied by Westinghouse Air Brake Company and the Computer Controlled Brake (CCB) system developed by New York Air Brake Company. It is projected that by the end of 1997 there will be over 1,000 locomotives in service equipped with the CCB system and over 1,400 locomotives in service equipped with the EPIC system.

In May of 1996, the RSAC Working Group decided to form a task force to consider issues related to electronically controlled locomotive brake systems. Rather than create an entirely new task force, the Working Group assigned the task to a group of individuals that were members of the previously established ''New Technology Joint Information Committee'' created to address issues related to the operation of these types of brake systems as well as the training of those individuals using this new technology. This task force addressed several issues related to these braking systems including: design; training; inspection and testing; and maintenance. The task force concluded that additional regulation of these types of locomotive braking systems was unnecessary since the current regulations or waivers sufficiently address the training, inspection, and maintenance of these systems and any additional design requirement would most likely not enhance safety and would probably restrict the advancement of new technology.

The task force did recommend that some changes be made to language contained in part 229 to permit an extension in the testing cycles for the electronic gauges used in these types of locomotive brake systems. The task force recommended that part 229 be revised to increase the testing interval for these electronic gauges from 92 days to an annual cycle. The task force believed that such an extension was warranted based on the technology incorporated into these types of electronic gauges, which has significantly increased their reliability over standard mechanical gauges. Some of the items noted by the task force which create greater reliability of these gauges included the following: the electronic components have longer life cycles than those in mechanical gauges; the accuracy and durability of the transducer has been extended; and internal computer diagnostics detect inaccuracies prior to gauges becoming defective under federal regulations. FRA concluded from facts and judgements expressed by individual members of the Working Group that the recommendations of the task force would be acceptable. Furthermore, FRA agrees with the findings of the task force, and thus, proposes the changes to part 229 recommended by the task force.

FRA also proposes to amend part 229 by adding a new provision to the annual test required by § 229.27 to require that the locomotive compressor or compressors be tested for capacity by orifice test at this interval. This requirement is currently contained in § 232.10(c) but does not currently specify a time frame within which the testing must occur. Thus, in order to clarify the requirement FRA believes that the performance of this test on an annual basis will ensure the proper operation of these compressors. FRA believes that the specification of a time frame for performance of this test will have little or no impact on the railroads as many railroads currently perform this test at this interval and because the test is fairly simple to perform.

Amendments to 49 CFR Part 231

FRA proposes minor clarifying changes in the applicability section of this part. These changes are intended to make the regulatory exceptions consistent with the exceptions contained in the statute. The added exceptions are taken directly from 49 U.S.C. 20301 (previously codified at 45 U.S.C. 6). It is noted that the word ''freight'' has been added to the exceptions in order to remain consistent with Congress' intent when the statutory exceptions were created. At the time Congress provided an exception from the requirements of the Acts, Congress did not and could not envision that the equipment used in these operations would be modified for the purposes of hauling passengers, which FRA has discovered with regard to four-wheel coal cars. Consequently, FRA will only except freight operations which employ the types of equipment contained in these amendments.

FRA also proposes to move the provisions related to drawbars from part 232 where they are currently contained to this part. FRA believes that part 231 is a more logical place for the drawbar provisions to be located as they are more of a safety appliance-type component than a brake system component. Although FRA has redrafted the provisions for clarity and readability, FRA does not intend to change any of the basic drawbar provisions currently contained in § 232.2.

49 CFR Part 232

Subpart A—General

Section 232.1 Purpose and Scope

This section contains a formal statement of the proposed rules' purpose and scope. FRA intends the proposed rules to cover all brakes systems and brake components used in any freight train operation or any other non-passenger train operation.

Section 232.3 Applicability

As a general matter, in paragraph (a), FRA proposes that this rule apply to all railroads that operate freight or other non-passenger train service on standard gage track which is part of the general railroad system of transportation. In paragraph (b) of this section, FRA makes clear that Subpart E of this proposal applies to all trains that operate on the general system regardless of the commodity it hauls, unless it is specifically excepted by the provisions contained in Subpart E. Subpart E contains the requirements regarding the use of two-way end-of-train devices which were issued on January 2, 1997 and became effective on July 1, 1997. Although FRA proposes some minor changes to these requirements, principally for clarification, the provisions contained in Subpart E are virtually identical to the existing requirements.

Paragraph (c) of this section contains a listing of those operations and equipment for which FRA does not intend this proposed rule to apply. These include: rapid transit operations not connected to the general system; commuter, intercity, and other short-haul passenger operations; and tourist, scenic, historic, or excursion operations. In 1994, FRA issued a power brake NPRM in which FRA attempted to draft a proposal covering all railroad operations. FRA received a multitude of comments suggesting that similar treatment of passenger and freight operations was not a viable approach due to the significant differences in the operating environment and equipment used in these operations. Based on these comments, FRA decided to separate passenger and freight operations and FRA is currently addressing the power brake issues related to passenger and commuter operations in a separate rulemaking specifically tailored to those types of operations. Similarly, the Federal Railroad Safety Authorization Act of 1994 directs FRA to examine the unique circumstances of tourist and historic railroads when establishing safety regulations. The Act, which amended 49 U.S.C. 20103, states that:

> In prescribing regulations that pertain to railroad safety that affect tourist, historic, scenic, or excursion railroad carriers, the Secretary of Transportation shall take into consideration any financial, operational, or other factors that may be unique to such railroad carriers. The Secretary shall submit a report to Congress not later than September 30, 1995, on actions taken under this subsection.

Pub. L. No. 103–440, § 217, 108 Stat. 4619, 4624, November 2, 1994. In response to this mandate, FRA has established a Tourist and Historic Railroads Working Group formed under RSAC to specifically address the applicability of FRA's regulations to these unique types of operations. Consequently, any requirements proposed by FRA for these types of operations will be part of a separate rulemaking proceeding. However, FRA may retain existing provisions of part 232 as applicable to such operations to the extent part 232 currently applies in order to avoid regulatory gaps while power brake provisions for such service are finalized.

Similar to the amendments proposed for part 231, paragraph (c)(6)-(c)(8) of this section also contains the expressed exceptions currently contained in the statute for certain coal cars and logging cars. These proposed provisions are intended to make the regulatory exceptions consistent with the exceptions contained in the statute. The added exceptions are taken directly from 49 U.S.C. 20301 (previously codified at 45 U.S.C. 6). It is noted that the word ''freight'' has been added to the exceptions in order to remain consistent with Congress' intent when the statutory exceptions were created. At the time Congress provided an exception from the requirements of the Acts, Congress did not and could not envision that the equipment used in these operations would be modified for the purposes of hauling passengers, which FRA has discovered with regard to four-wheel coal cars. Consequently, FRA will only except freight operations which employ the types of equipment contained in these amendments.

Proposed paragraph (d) and (e) of this section revokes the Interstate Commerce Commission Order 13528, of May 30, 1945, as amended (codified in existing § 232.3 and Appendix B to part 232), and codifies some of the relevant provisions of that Order. Thus, paragraph (e) of this section contains a list of equipment which were excepted from the Order's specifications and requirements for operating power-brake systems for freight service and to which the proposed requirements are not applicable. FRA believes that the Order is no longer completely relevant or necessary and believes that the relevant provisions should be incorporated into this section. In addition, FRA intends to reference current industry standards containing performance specifications for freight power brakes in other portions of this proposal which mirror the provisions contained in the Order.

It should be noted that this section contains no specific reference to private cars or circus trains. As private cars are designed to carry passengers and are generally hauled in both freight and passenger trains, FRA intends that these types of cars be covered by both the recently proposed Passenger Equipment Safety Standards and these proposed requirements. For example, these types of cars will be subject to the maintenance and equipment standards applicable to passenger equipment but will be covered by the inspection requirements contained in this proposal when hauled in a freight train. With regard to circus trains, FRA intends that these operations be covered by this proposal due to the unique nature of this equipment and operations. Although circus trains carry some employees, the majority of the train is composed of freight-type equipment and are operated in manner similar to a freight train. Thus, for consistency purposes, FRA intends that the proposed rules apply to circus train operations.

Section 232.5 Definitions

This section contains an extensive set of definitions to introduce the regulations. FRA intends these definitions to clarify the meaning of important terms as they are used in the text of the proposed rule. The proposed definitions are carefully worded in an attempt to minimize the potential for misinterpretation of the rule. Several of the definitions introduce new concepts or new terminologies which require further discussion.

''Brake indicator'' means a device, actuated by brake cylinder pressure, which indicates whether brakes are applied or released on a car. The use of brake indicators in the performance of brake tests is a controversial subject. Rail labor organizations correctly maintain that brake indicators are not fully reliable indicators of brake application and release on each car in the train. Further, railroads correctly maintain that reliance on brake indicators is necessary because inspectors cannot always safely observe brake application and release. FRA believes that brake indicators can serve an important role in the performance of brake tests, particularly in those

instances where the design of the equipment requires inspectors to place themselves in potentially dangerous position in order to observe the brake actuation or release.

The concept of ''ordered'' or ''date ordered'' is vital to the correct application of this proposed rule. The terms mean the date on which notice to proceed is given by a procuring railroad to a contractor or supplier for new equipment. Some of the provisions of the proposed rule will apply only to newly constructed equipment. When FRA proposes to apply requirements only to equipment ordered on or after January 1, 1999, or placed in service for the first time on or after January 1, 2001, FRA intends to grandfather any piece of equipment that is both ordered before January 1, 1999, and placed in service for the first time before January 1, 2001. FRA believes this approach will allow railroads to avoid any costs associated with changes to existing orders and yet limit the delay in realizing the safety benefits of the requirements proposed in this rule.

The definition of ''point of origin'' is intended to encompass those locations traditionally considered initial terminals, that is the location where a train is originally assembled. For clarity purposes, FRA will consider a location to be a place where a train is originally assembled, to be the location where a vast majority of the cars in a train are added to the train. FRA has discovered that some railroads are assembling two or more locomotives together with only a few cars at one location and performing an initial terminal inspection pursuant to § 232.12 on the train at that location. The train is then moved a very short distance (less than 20 miles) where forty or more cars are added to the train with the performance of only an intermediate brake inspection being performed. FRA believes this practice is clearly an attempt to circumvent the inspection requirements currently contained in the regulations. Consequently, FRA intends to make clear that it will consider that location where the majority of cars are added to the train to be the point of origin or initial terminal for that train, as that is the location where the train is in fact assembled. FRA recognizes that such a standard will have to be looked at on a case-by-case basis, but believes that the above mentioned scenario is a clear case where a railroad is attempting to avoid the comprehensive inspection requirements imposed on a train at its point of origin.

The definitions of ''qualified person'' and ''qualified mechanical inspector'' are vital to interpreting the proposed inspection, testing, and maintenance provisions of the rule. A ''qualified person'' is a person determined by the railroad to have the knowledge and skills necessary to perform one or more functions required under this part. With the proper training, a train crewmember could be a qualified person. Whereas, a ''qualified mechanical inspector'' is a ''qualified person'' who as a part of the training, qualification, and designation program required under § 232.203 has received instruction and training that includes ''hands-on'' experience (under appropriate supervision or apprenticeship) in one or more of the following functions: trouble-shooting, inspection, testing, maintenance, or repair of the specific train brake and other components and systems for which the inspector is assigned responsibility. Further, the mechanical inspector must be a person whose primary responsibility includes work generally consistent with those functions. Consequently, a train crewmember would likely not be a qualified mechanical inspector.

FRA includes a clear definition of ''qualified person'' to allow railroads the flexibility of having train crews continue to perform various brake tests. A qualified person must be trained and designated as able to perform the types of brake inspections and tests that the railroad assigns to him or her. However, a qualified person need not have the extensive knowledge of brake systems or components or be able to trouble-shoot and repair them. The qualified person is the ''checker.'' He or she must have the knowledge and experience necessary to be able to identify brake system problems.

FRA provides a clear definition of qualified mechanical inspector so that a differentiation can be made between the comprehensive knowledge and training possessed by a professional mechanical employee, and the more specialized training and general knowledge possessed by train crews. This definition largely rules out the possibility of train crewmembers becoming a qualified mechanical inspector. Part of the definition requires the primary job of a qualified mechanical inspector to be inspection, testing, or maintenance of freight brake equipment. FRA intends the definition to allow the members of the trades associated with testing and maintenance of equipment such as carmen, machinists, and electricians to become qualified mechanical inspectors. However, membership in labor organizations or completion of apprenticeship programs associated with these crafts is not required to be a qualified mechanical inspector. The two primary qualifications are possession of the knowledge required to do the job and a primary work assignment inspecting, testing, or maintaining the equipment.

Discussions conducted in the Working Group meetings revealed that railroad operators believe these definitions are too restrictive and will require training beyond the minimum needed for many employees to do their jobs. On the other hand, the representatives of labor organizations maintain that this approach will allow unqualified train crewmembers to conduct tests and inspections that should be performed only by mechanical employees.

FRA believes the proposed rule strikes the correct balance between these conflicting points of view. FRA agrees with labor representatives that mechanical employees generally conduct a more thorough inspection than train crewmembers. As a result, FRA will only permit trains which have been inspected by mechanically qualified inspectors to move beyond the currently permitted 1,000 mile limit without an additional brake inspection. At the same time, FRA agrees with railroad operators that properly trained train crewmembers are capable of performing brake tests and have been doing so effectively for years. As a result, the proposed rule grants flexibility to railroads to continue to use properly trained train crewmembers to perform certain brake tests, while providing the incentive of extended movements to railroads that use more highly qualified mechanical inspectors to perform other brake tests.

The definition of ''solid block of cars'' is included in order to clarify some serious misunderstandings currently existing in various segments of the industry. FRA believes that the definition provided in this proposal is consistent with longstanding agency interpretation and the clear intent of the regulations. This definition makes clear that the phase ''solid block of cars'' is intended to describe a set of cars that were all a part of one train and that have remained coupled together until added to another train. The phrase was never intended, nor is it intended in this proposal, to mean groups of cars removed from various different trains that are then assembled into a block for addition into another train. In FRA's view, the above described action constitutes the assembling of a new train which would require the performance of an appropriate brake test and inspection.

The definitions of ''transfer train,'' ''yard train,'' and ''switching service'' are somewhat interrelated since the determination as to whether, at a minimum, a transfer train brake test is required is based on whether the movement is a switching movement or a train movement. A ''transfer train'' is defined as a train that travels between a point of origin and a point of destination, located no more than 20 miles apart, and which is not performing switching service. A ''yard train'' is defined as a train that only performs switching service within a single yard complex. ''Switching service'' is defined as the classification of cars according to commodity or destination; assembling of cars for train movements; changing the position of cars for purposes of loading, unloading, or weighing; placing of locomotives or cars for repair or storage; or moving of rail equipment in connection with work service that does not constitute a train movement. Thus, a train engaged in switching service carries the potential of becoming a transfer train, subject to a transfer train's testing requirements, if the movement it will be engaged in is considered a ''train movement'' rather than a ''switching movement.'' FRA's determination of whether the movement of cars is a ''train movement,'' subject to the requirements of this section, or a ''switching movement'' is and will be based on the voluminous case law developed by various courts of the United States.

FRA's general rule of thumb as to whether a trip constitutes a ''train movement'' requires five or more cars traveling a distance of at least one mile without a stop to set off or pick up a car and not moving for the purpose of assembling or disassembling a train. However, FRA may consider movements of less than one mile ''train movements'' if various circumstances exist. In determining whether a particular movement constitutes a ''train movement,'' FRA conducts a multi-factor analysis based upon the discussions contained in various court decisions on the subject. *See e.g. United States* v. *Seaboard Air Line R. R. Co.*, 361 U.S. 78 (1959); *Louisville & Jeffersonville Bridge Co.* v. *United States*, 249 U.S. 543 (1919). The following factors are taken into consideration by FRA: the purpose of the movement; the distance traveled without a stop to set out or pick up cars; the number of cars hauled; and the hazards associated with the particular route traveled (e.g., the existence of public or private crossings with or without crossing protection, the steepness of the grade, the existence of curves, any other conditions that minimize the locomotive engineer's sight distance, and any other conditions that may create a greater need for power brakes during the movement). The existence of any of these hazards would tend to weigh towards the finding of a ''train movement,'' since these are the types of hazards against which the power brake provisions of the Federal rail safety laws were designed to give protection.

Section 232.7 Waivers

This section sets forth the procedures for seeking waivers of compliance with the requirements of this rule. Requests for such waivers may be filed by any interested party. In reviewing such requests, FRA conducts investigations to determine if a deviation from the general criteria can be made without compromising or diminishing rail safety.

Section 232.9 Responsibility for Compliance

General compliance requirements are contained in this section. In accordance with the ''use'' or ''haul'' language previously contained in the Safety Appliance Acts (49 U.S.C. chapter 203), and with FRA's general rulemaking authority under the Federal railroad safety laws, FRA proposes that any train, railroad car, or locomotive covered by this part will be considered ''in use'' prior to departure but after it receives or should have received the necessary tests and inspections required for movement. FRA would no longer necessarily wait for a piece of equipment with a power brake defect to be hauled before issuing a violation, a practice frequently criticized by the railroads. FRA believes that this approach will increase FRA's ability to prevent the movement of defective equipment that creates a potential safety hazard to both the public and railroad employees. FRA does not feel that this approach increases the railroads' burden since equipment should not be operated if it is found in defective condition in the pre-departure tests and inspections, unless permitted by the regulations. In fact, this modification of FRA's perspectives as to when a piece of equipment will be considered ''in use'' was fully discussed by members of the Working Group and based upon the opinions and judgments expressed by individual members of the group, FRA has concluded that the proposal is an appropriate approach. Both rail labor and rail management representatives supported the approach contained in this proposal agreeing that the current practice of waiting for a defective piece of equipment to depart from a location does very little to promote or ensure the safety of trains.

This section also clarifies FRA's position that the requirements contained in the proposed rules are applicable to any ''person,'' as broadly defined in § 232.11, that performs any function required by the proposed rules. Although various sections of the proposed rule address the duties of a railroad, FRA intends that any person who performs any action on behalf of a railroad or any person who performs any action covered by the proposed rule is required to perform that action in the same manner as required of a railroad or be subject to FRA enforcement action. For example, private car owners and contract shippers that perform duties covered by these proposed regulations would be required to perform those duties in the same manner as required by a railroad.

Paragraph (c) proposes that any person as broadly defined in § 232.11 that performs any function or task required by this part will be deemed to have consented to FRA inspection of their operation to the extent necessary to ensure that the function or task is being performed in accordance with the requirements of this part. This proposed provision is intended to put railroads, contractors, and manufacturers which elect to perform tasks required by this part on notice that they are consenting to FRA's inspection of that portion of their operation which is performing the function or task required by this part. In most cases, this involves a contractor's performance of certain required brake inspections or the performance of specified maintenance on cars, such as, conducting single car or repair track tests on behalf of a railroad. FRA believes that if a person is going to perform a task required by this part, FRA must have the ability to view the performance of such tasks to ensure that they are conducted in compliance with federal regulations. Without such oversight, FRA believes that the requirements contained in the regulations would become illusionary and could be easily circumvented by some railroads. FRA believes that it has the statutory authority pursuant to 49 U.S.C. 20107 to inspect any facility or operation which performs functions or tasks required under this part, and this provision is merely intended to make that authority clear to all persons performing such tasks or functions.

Section 232.11 Penalties

This section identifies the civil penalties that FRA may impose upon

any person, including a railroad or an independent contractor providing goods or services to a railroad, that violates any requirement of this part. These penalties are authorized by 49 U.S.C. 21301, 21302, and 21304. The penalty provision parallels penalty provisions included in numerous other safety regulations issued by FRA. Essentially, any person who violates any requirement of this part or causes the violation of any such requirement will be subject to a civil penalty of at least $500 and not more than $11,000 per violation. Civil penalties may be assessed against individuals only for willful violations, and where a grossly negligent violation or a pattern of repeated violations creates an imminent hazard of death or injury to persons, or causes death or injury, a penalty not to exceed $22,000 per violation may be assessed. In addition, each day a violation continues will constitute a separate offense. It should be noted that, the Federal Civil Penalties Inflation Adjustment Act of 1990, Pub. L. 101–410 Stat. 890, 28 U.S.C. 2461 note, as amended by the Debt Collection Improvement Act of 1996 Pub. L. 104–134, April 26, 1996 required agencies to adjust for inflation the maximum civil monetary penalties within the agencies jurisdiction. The resulting $11,000 and $22,000 maximum penalties noted in this section were determined by applying the criteria set forth in sections 4 and 5 of the statute to the maximum penalties otherwise provided for in the Federal railroad safety laws. Finally, paragraph (b) makes clear that a person may be subject to criminal penalties under 49 U.S.C. 21311 for knowingly and willfully falsifying reports required by these regulations. FRA believes that the inclusion of penalty provisions for failure to comply with the regulations is important in ensuring that compliance is achieved.

The final rule will include a schedule of civil penalties as appendix A to this part. Because such penalty schedules are statements of policy, notice and comment are not required prior to their issuance. See 5 U.S.C. 553(b)(3)(A). Nevertheless, commenters are invited to submit suggestions to FRA describing the types of actions or omissions under each regulatory section that would subject a person to the assessment of a civil penalty. Commenters are also invited to recommend what penalties may be appropriate, based upon the relative seriousness of each type of violation.

Section 232.13 Preemptive Effect

This section informs the public as to FRA's views regarding what will be the preemptive effect of the final rule. While the presence or absence of such a section does not in itself affect the preemptive effect of a final rule, it informs the public concerning the statutory provision which governs the preemptive effect of the rule. Section 20106 of title 49 of the United States Code provides that all regulations prescribed by the Secretary relating to railroad safety preempt any State law, regulation, or order covering the same subject matter, except a provision necessary to eliminate or reduce an essentially local safety hazard that is not incompatible with a Federal law, regulation, or order and that does not unreasonably burden interstate commerce. With the exception of a provision directed at an essentially local safety hazard, 49 U.S.C. 20106 will preempt any State regulatory agency rule covering the same subject matter as the regulations proposed today when issued as final rules. This section further informs the public that FRA does not intend to preempt provisions of State criminal law that impose sanctions for reckless conduct that leads to actual loss of life, injury, or damage to property, whether such provisions apply specifically to railroad employees or generally to the public at large.

Section 232.15 Movement of Defective Equipment

This section contains the provisions regarding the movement of equipment with defective brakes without civil penalty liability. The proposed provisions contained in this section are almost identical to the provisions proposed in the 1994 NPRM and incorporate the stringent conditions currently contained in 49 U.S.C. 20302, 20303, 21302, and 21304 (previously codified at 45 U.S.C. 13). As pointed out in the previous discussion, most of the alternative proposals received by FRA in response to the 1994 NPRM and the subsequent RSAC Working Group meetings all contained provisions regarding the movement of equipment with defective brakes which are in direct conflict with the statutory requirements. *See* Discussion of Issues and General FRA Conclusions portion of the preamble under the heading ''Movement of Equipment with Defective Brakes.'' Therefore, FRA intends to propose provisions related to the movement of defective equipment which are very similar to the requirements proposed in the 1994 NPRM. *See* 59 FR 47728. However, the current proposal clarifies the tagging requirements, contains provisions regarding the placement of defective equipment, and provides a consistent method for calculating the percentage of operative brakes on a train. Consequently, in addition to being consistent with the statutory requirements, FRA believes that the proposed requirements will ensure the safe and proper movement of defective equipment and will clarify the duties imposed on a railroad when moving such equipment.

Paragraph (a) of this section proposes various parameters which must exist in order for a railroad to be deemed to be hauling a piece of equipment with defective brakes for repairs. The majority of the proposed requirements in this paragraph should pose absolutely no burden to railroads as they are merely a codification of existing statutory requirements. The only new requirement being proposed by FRA in this paragraph is that all cars or locomotives found with defective or inoperative braking equipment be tagged as bad ordered with a designation of the location where the necessary repairs can and will be effectuated and that a qualified person determine the safety parameters for moving a piece of defective equipment. Although these are new requirements, most railroads already tag defective brake equipment upon its discovery. In paragraph (a), FRA has again attempted to expressly clarify the requirement that equipment with defective brakes shall not depart from or be moved beyond a location where the necessary repairs to the equipment can be performed. Therefore, if a car or locomotive is found with defective brakes during any of the proposed brake inspections or while the piece of equipment is en route and the location where the defective equipment is discovered is a place where repairs of the type needed can be performed, that car or locomotive shall not be moved from that location until the necessary repairs are effectuated. However, if repairs to the defective condition cannot be performed at the location where the defect is discovered, or should have been discovered, this proposal makes clear that the railroad is permitted to move the equipment with the defective condition only to the nearest location where the necessary repairs can be performed.

Paragraph (a) also codifies and clarifies the statutory restrictions on the movement of equipment with defective brakes onto the line of a connecting railroad. Hence, the delivery of defective equipment in interchange would be covered by these restrictions. In addition to fulfilling the other requirements set out in this section, the railroad seeking relief from civil penalty liability must show that the connecting

railroad has elected to accept the non-complying equipment and that the point of repair on the connecting railroad's line, where the equipment will be repaired, is no further than the point where the repairs could have been made on the line where the equipment was first found to be defective.

What constitutes the nearest location where the necessary repairs can be performed is an issue FRA has grappled with for decades and has become exceedingly more difficult with the growing use of mobile repair trucks. As discussed in detail above, FRA does not believe that one standard can be adequately developed which would be applicable to all situations. Thus, FRA intends to approach the issue of what constitutes the nearest repair location based on a case-by-case analysis of each situation. FRA believes that its field inspectors are in the best position to determine whether a railroad exercised good faith in determining when and where to move a piece of defective equipment. In making these determinations both the railroad as well as FRA's inspectors must conduct a multi-factor analysis based on the facts of each case.

In determining whether a particular location is a location where necessary repairs can be made or whether a location is the nearest repair location, the accessibility of the location and the ability to safely make the repairs at that location are the two overriding factors that must be considered in any analysis. These two factors have a multitude of sub-factors which must be considered, such as: the type of repair required; the safety of employees responsible for conducting the repairs; the safety of employees responsible for getting the equipment to or from a particular location; the switching operations necessary to effectuate the move; the railroads recent history and current practice of making repairs (brake and non-brake) at a particular location; and relevant weather conditions. Although the distance to a repair location is a key factor, distance alone is not the determining factor of whether a particular location is the nearest location for purposes of effectuating repairs and must be considered in conjunction with the factors noted above. Existing case law makes clear that neither the congestion of work at a particular location or convenience to the railroad are to be considered when conducting this analysis.

Paragraph (b) of this section contains the specific requirements regarding the tagging of equipment found with defective brake components. The requirements proposed in this paragraph are very similar to the tagging requirements currently contained in part 215, regarding the movement of equipment not in compliance with the Freight Car Safety Standards, and are generally consistent with how most railroads currently tag equipment found with defective brakes. FRA recognizes that the industry is attempting to develop some type of automated tracking system capable of retaining the information required by this section and tracking defective equipment electronically, which FRA envisions would be used on an industry-wide level. Consequently, FRA has expressly provided the option to use an automated tracking system if it is approved by FRA. Currently, FRA has several concerns regarding the accessibility, reliability, and security of the system being considered by the industry and would not approve such a system without having those concerns addressed.

Paragraph (c) contains the proposed provision restricting the movement of a vehicle with defective brakes for the purpose of unloading or purging only if it is necessary for the safe repair of the car. This proposed restriction is fully consistent with the statutory provisions regarding the movement of equipment with defective safety appliances.

Paragraph (d) explains the term ''inoperative power brakes'' and proposes a new method for calculating the percentage of operative power brakes (operative primary brakes) in a train. Regarding the term itself, a cut-out power brake is an inoperative power brake, but the failure or cutting out of a secondary brake system does not result in inoperative power brakes; for example, failure of the dynamic brake does not render a power brake inoperative. FRA also intends to make clear that inoperative handbrakes or power brakes overdue for maintenance or stenciling should not be considered inoperative for purposes of calculation. Furthermore, although a car may be found with piston travel which is in excess of the Class I brake test limits, it should not be considered inoperative until it exceeds the outside limits established for that particular type of piston design. However, a car found with piston travel that exceeds its Class I brake test limits would be considered a defective condition if the piston travel were not adjusted at the time that a Class I brake test were performed.

Although the statute discusses the percentage of operative brakes in terms of a percentage of vehicles, the statute was written nearly a century ago and at that time the only way to cut out the brakes on a car or locomotive was to cut out the entire unit. *See* 49 U.S.C. 20302(a)(5)(B). Today, many types of freight equipment can have the brakes cut out on a per-truck basis and FRA expects this tend to increase as the technology is applied to newly acquired equipment. Consequently, FRA merely proposes a method of calculating the percentage of operative brakes based on the design of equipment used today, and thus, a means to more accurately reflect the true braking ability of the train as a whole. FRA believes that the proposed method of calculation is consistent with the intent of Congress when it drafted the statutory requirement and simply recognizes the technological advancements made in braking systems over the last century. Consequently, FRA proposes to permit the percentage of operative brakes to be determined by dividing the number of control valves that are cut-in by the total number of control valves in the train.

Paragraph (e) contains the proposed requirements regarding the placement of cars in a train that have inoperative brakes. The proposed restrictions are consistent with current industry practice and are part of almost every major railroad's operating rule. The proposed provision would prohibit the placing of a vehicle with inoperative brakes at the rear of the train. In addition, the proposal would prohibit the consecutive placing of more than two vehicles with inoperative brakes as test rack demonstrations have indicated that when three consecutive cars have their brakes cut-out it is not always possible to obtain an emergency brake application on trailing cars. FRA has extrapolated the restriction on the consecutive placing of defective cars to multi-unit articulated equipment, prohibiting the placement in a train of such equipment if it has consecutive individual control valves cut-out or inoperative, which is consistent with current industry practice.

Section 232.17 Special Approval Process

This section contains the procedures to be followed when seeking to obtain FRA approval of a pre-revenue service acceptance plan under § 232.505 for completely new brake system technologies or major upgrades to existing systems or when seeking to change one of the established industry maintenance standards referenced in §§ 232.303, 232.305, or 232.307. Several railroads and manufacturers contended, both in response to the 1994 NPRM and at the RSAC Working Group meetings, that FRA needed to devise some sort of quick approval process in order to permit the industry to make

modifications to existing standards or equipment based on the development of new technology. Thus, FRA has attempted to propose an approval process it believes should speed the process for taking advantage of new technologies over that which is currently available under the waiver process. However, in order to provide an opportunity for all interested parties to provide input for use by FRA in its decision making process, as required by the Administrative Procedure Act, FRA believes that any special approval provision must, at a minimum, provide proper notice to the public of any significant change or action being considered by the agency with regard to existing regulations.

Subpart B—General Requirements

Section 232.101 Scope

This section contains a formal statement of the scope of this specific subpart of the proposal. This subpart is intended to provide general operating, performance, and design standards for railroads that operate freight or other non-passenger trains and further contains specific requirements for equipment used in these types of operations.

Section 232.103 General Requirements for All Train Brake Systems

This section contains general requirements that are applicable to all freight and non-passenger train brake systems. FRA proposes to specifically include basic train brake system practices and procedures that form the foundation for the safe operation of all types of trains. Some of these basic principles are so obvious that they have not been specifically included in past rules. For example, in paragraphs (a)–(c) FRA has included the most basic safety requirements for all train brake systems which include having the ability to stop a train within the existing signal spacing, maintaining and monitoring the integrity of the train brake communication line, and having the train brake system respond as intended to signals from the brake communication line.

In paragraph (d), FRA proposes to continue the requirement that prior to use or departure from a point of origin (initial terminal) all trains shall have 100 percent operative and effective brake systems. This has been a requirement in the railroad industry for decades and FRA believes it is not only wise from a safety standpoint, as it ensures the proper operation of a train's brake system at least once during its life, but it sets the proper tone for what FRA expects to be accomplished at these locations. FRA believes that requiring 100 percent operative brakes on all trains at their inception provides the railroads with a margin for failure of some brakes while the train is in transit (up to 15 percent) and tends to ensure that defective equipment is being repaired in a timely fashion. In addition, FRA believes that the 100 percent requirement is consistent not only with Congress' understanding of the AAR inspection standards that were adopted in 1958, but also with the intent of FRA, rail management, and rail labor as to what was to occur at initial terminals when the inspection interval was increased from 500 miles to 1,000 miles in 1982. At that time, carrier representatives committed to the performance of quality initial terminal inspections in exchange for an extension in the inspection interval, for which FRA intends to hold them accountable. In addition, the 100 percent requirement is consistent with the statutory requirements regarding the movement of defective equipment because a majority of the locations where trains are initiated have the capability of conducting virtually any brake system repair, and thus, the defective equipment could not be moved from those locations anyway.

FRA recognizes that the 100 percent requirement at points of origin tends to be somewhat burdensome for some railroads at certain locations. Although railroads are required to have 100 percent operative brakes at initial terminals, railroads are currently permitted to pick-up defective cars at these same locations, if the necessary repairs cannot be performed, and haul them for repairs. Thus, a situation exists wherein the railroad is required to set a defective car out of a train if the train is initiated at that location, but are then able to pick-up that same defective car in an en route train and haul it to the nearest location where the necessary repairs can be performed. FRA recognizes that this creates a somewhat illogical situation; however, FRA believes that by retaining the 100 percent requirement at these locations the public is assured that a train's brake system is in near perfect condition at the beginning of its journey, train crews are more cognizant of the presence of defective cars in the train when they are picked-up en route, railroads are more likely to perform repairs at a location where trains are initiated in order to avoid breaking-up trains to set-out defective cars once the trains are assembled, and FRA retains a clear and consistent enforcement standard that can be easily understood by its inspectors and railroad industry employees.

Although FRA has internally attempted to develop suitable industry-wide criteria for permitting trains to depart points of origin with a minimum number of defective brakes if the location is one where the necessary repairs cannot be made, FRA is not willing to permit such flexibility without fully considering the safety hazards or potential abuses which may accompany such an approach. Therefore, FRA seeks comment from interested parties regarding the potential for permitting very limited flexibility in moving defective equipment from outlying points of origin which lack the capability of effectuating brake system repairs. Of major concern to FRA is the potential for railroads to designate a large number of locations, where trains are initiated, as being unable to effectuate brake system repairs by merely closing existing repair facilities or reducing the capability of mobile repair vehicles at the locations. Therefore, any potential flexibility must ensure that only those locations that are truly incapable of performing brake system repairs, due to the physical geography or design of the location, are afforded the flexibility. In addition, FRA must have to have the ability to approve any designation made by a railroad to ensure that the location is truly one in need of the flexibility and that the designated repair location is actually the nearest location where proper repairs could be made. Furthermore, any approach must also ensure the adequate identification and tracking of the trains and defective equipment moved from the location.

One potential method of ensuring limited designations is to require the designation of a location within a very short distance (50–100 miles) of the outlying location where all repairs will be conducted. Under this approach, FRA would strictly limit the percentage of inoperative brakes (5 percent or less) that could be moved in a train from that location and would require a qualified inspector to determine the safety of such a move. An alternative approach might include the ability of the railroad to perform something less than a full Class I brake test at the train's point of origin and permit the movement of the train a very short distance (50 miles or less) to a designated location where the train would receive a complete Class I brake test.

FRA believes that permitting some limited flexibility in this area might have the potential of actually increasing the safety of trains originating at some

outlying locations that lack the ability to effectuate brake system repairs. It would likely reduce the amount of switching that occurs at these locations as defective equipment could remain entrained until it reaches a more conducive location for being repaired, inspected, or set-out of the train. It might also reduce the percentage of defective equipment which may move in any single train from some of these location where run-through or local trains are used to move the defective equipment to another location for repair as railroad's will not let the number of cars with defects build-up. In addition, it would reduce the distance that defective equipment is hauled before proper repairs are made since any approach would limit the distance such cars could be hauled before repairs or reinspection would be required. Furthermore, a more flexible approach might have the potential for increasing the quality of inspections since the restrictions for handling a defective piece of equipment would be somewhat less and trains would have the ability to be moved to a location where highly experienced inspectors are available.

In light of the preceding discussion, FRA seeks comments from all interested parties regarding the viability of permitting some flexibility in the 100 percent requirement for train initiated at outlying locations that lack repair capability and seeks recommendations on potential approaches for permitting such flexibility. Specifically, FRA seeks comment or information on the following:

1. How many locations currently exist that are initial terminals for some trains that lack the capability of effectuating any brake system repairs? Partial repair ability? If so, what types of repairs can generally be made?

2. How many trains are currently initiated at locations that lack the capability to perform brake system repairs?

3. How do railroads currently handle equipment found with defective brakes at initial terminals that lack the ability to effectuate the necessary repairs?

4. What operational or record keeping requirements should be imposed on trains if they were permitted to depart a point of origin with a minimum number of cars with defective brakes entrained?

5. Are any of the potential safety benefits described above valid? What are the potential safety hazards or concerns in permitting such flexibility?

In paragraph (e), FRA proposes a clear and absolute prohibition on train movement if more than 15 percent of the cars in a train have their brakes cut out or have otherwise defective brakes. Although there is no limit contained in the statute regarding the number of cars with defective brake equipment that may be hauled in a train, the 15 percent limitation is a longstanding industry and agency interpretation of the hauling-for-repair provision currently codified at 49 U.S.C. 20303, 21302, and 21304, and has withstood the test of time. This interpretation is extrapolated from another statutory requirement which permits a railroad to use a train only if ''at least 50 percent of the vehicles in the train are equipped with power or train brakes and the engineer is using the power or train brakes on those vehicles and on all other vehicles equipped with them that are associated with those vehicles in a train.'' 49 U.S.C. 20302(a)(5)(B). As originally enacted in 1903, section 20302 also granted the Interstate Commerce Commission (ICC) the authority to increase this percentage, and in 1910 the ICC issued an order increasing the minimum percentage to 85 percent. *See* 49 CFR 232.1, which codified the ICC order. FRA proposed this same restriction in the 1994 NPRM and no major objections to this limitation were raised by any of the commenters. *See* 59 FR 47727. Consequently, FRA will continue to require that equipment with defective or inoperative air brakes makeup no more than 15 percent of any train.

As virtually all freight cars are presently equipped with power brakes and are operated on an associated trainline, the statutory requirement cited above is in essence a requirement that 100 percent of the cars in a train have operative power brakes, unless being hauled for repairs pursuant to 49 U.S.C. 20303. Consequently, in paragraph (f) FRA makes clear that a train's air brakes shall be in effective and operable condition unless a car is being hauled for repairs pursuant to the conditions proposed in § 232.15. This section also proposes the standard for determining when a freight car's air brakes are not in effective operating condition based on piston travel. The piston travel limits for standard 12-inch stroke brake cylinders are the same as currently required under § 232.11(c). However, the experience of FRA indicates a proliferation of equipment with other than standard 12-inch stroke brake cylinders. As a result, mechanical forces and train crew members performing brake system inspections often do not know the acceptable range of brake piston travel for this non-standard equipment. In an attempt to improve this situation and to ensure the proper operation of a car's brakes after being inspected, FRA in paragraph (g) intends to require badge plates, stickers or stenciling of cars with the acceptable range of piston travel for all vehicles equipped with other than standard 12-inch stroke brake cylinders. The information on the badge plate, sticker, or stencil must include both the permissible brake cylinder piston travel range for the vehicle at Class I brake tests and the length at which the piston travel renders the brake ineffective. FRA believes that this information is essential in order for a person to properly perform the brake inspections proposed in this rule due to the growing number of cars with other than standard brake designs.

Paragraph (h) requires that all equipment ordered on or after January 1, 1999, or placed in service for the first time on or after January 1, 2001, be designed not to require an inspector to place himself or herself on, under, or between components of the equipment to observe brake actuation or release. The proposal allows railroads the flexibility of using a reliable indicator in place of requiring direct observation of the brake application or piston travel because the current or future designs of some freight car brake systems make direct observation extremely difficult without the inspector placing himself or herself underneath the equipment. Brake system piston travel or piston cylinder pressure indicators have been used with satisfactory results for many years. Although indicators do not provide 100 percent certainty that the brakes are effective, FRA believes that they have proven themselves effective enough to be preferable to requiring an inspector to assume a dangerous position.

This proposed requirement stems primarily from the brake system design of double-stack equipment currently used by several larger freight operations. Several commenters have indicated that the functioning of the brakes on this type of equipment cannot be observed without inspectors placing themselves in potentially dangerous positions. In addition, a complete inspection of the brake equipment and systems used on double-stack equipment is time consuming. Consequently, inspectors are reluctant to conduct a complete brake inspection test on departing trains that contain this type of equipment. FRA feels that double-stack equipment is becoming a mainstay of the freight railroad industry and that this design deficiency must be corrected. Thus, FRA has attempted to make this a performance requirement by simply specifying how the equipment must

function and allowing the industry to determine the method of compliance.

Paragraph (i) proposes to require that an emergency brake application feature be available at any time and that it produce an irretrievable stop. This section merely codifies current industry practice and ensures that all equipment will continue to be designed with an emergency brake application feature. In the 1994 NPRM on power brakes, FRA proposed a requirement that all trains be equipped with an emergency application feature capable of increasing the train's deceleration rate a minimum of 15 percent. *See* 59 FR 47729. This proposed requirement merely restated the emergency specification currently contained in Appendix B to part 232. Comments received in response to that proposal indicated that some brake equipment currently in use or being developed could provide a deceleration rate with a full service application that is close to the emergency brake rate and that the proposed requirement would require the lowering of full service brake rates, thereby compromising safety and lowering train speeds. Based on these comments, FRA proposes the current requirement which is in accordance with suggestions made by several commenters.

Paragraph (j) proposes to require that the air brake components that control brake application and release be adequately sealed to prevent contamination by foreign material. This proposed requirement is merely a reiteration of a general specification requirement currently contained in Appendix B to part 232. It is intended to ensure that the air brake components are not compromised due to contamination from foreign materials which can cause premature failure of certain components resulting in the loss of braking ability.

Paragraphs (k) and (l) impose on the railroads the responsibility for determining maximum air brake system working pressure and maximum brake pipe pressure. These proposed provisions were contained in the 1994 NPRM, and FRA received no comments objecting to their inclusion. *See* 59 FR 47743. Thus, FRA intends to continue to allow individual railroads the wide latitude currently permitted in determining these pressures.

Paragraph (m) provides that except as provided by other provisions of this part, all equipment used in freight or other non-passenger trains shall, at a minimum, meet the performance specification for freight brakes in AAR standard S–469–47. The AAR standard referenced in this paragraph contains all the provisions currently contained in Appendix B to part 232. FRA recognizes that the provisions contained in the AAR standard have not been revised since 1947 and that some of the requirements may be outdated due to technological data. Consequently, FRA seeks comments from interested parties as to the necessity of referencing these standards as well as any information on any updated standards related to the performance of freight equipment that is currently being used throughout the industry.

Paragraph (n) proposes to require that en route trains qualified by the Air Flow Method that experience a brake pipe air flow of greater than 60 CFM or brake pipe gradient of greater than 15 psi and the movable pointer does not return to those limits within a reasonable time be stopped at the next available location and inspected for leaks in the brake system. This requirement was part of the general waiver granted to the AAR allowing the use of the air flow method to qualify train air brakes. FRA believes that this requirement is necessary to prevent trains with excessive leakage from continuing to operate. If a train has excessive leakage the engineer may lack the ability to stop the train using the air brake system.

Paragraph (o) contains the requirements regarding the setting and releasing of hand brakes prior to releasing the air brake and after the air brake is charged. The requirements contained in this paragraph are generally a reiteration of the guidance issued by FRA in Safety Advisory 97–2 on September 15, 1997. *See* 62 FR 49046. The securement guidance contained in Safety Advisory 97–2 is based upon FRA's review of the Fort Worth incident that occurred on August 20, 1997, and its awareness of other incidents involving the improper securement of rolling equipment. The Safety Advisory was issued in order to provide the industry with some assistance and guidance regarding securement procedures and to provide information on current practices of the industry related to the securement of rolling stock. *See* 62 FR 49046. The Safety Advisory contains certain recommended procedures which FRA believes will greatly reduce the likelihood of further accidents due to improperly secured rail equipment.

On August 20, 1997, a fatal head-on collision between a Union Pacific Railroad Company (UP) freight train and an unattended, runaway UP locomotive consist near Fort Worth, Texas, has caused FRA to focus on the effectiveness of certain railroad procedures for protection of people and property from hazards caused by failure to properly secure locomotives, cars, and other rolling equipment left unattended on sidings or other tracks. Although FRA and NTSB are currently investigating this incident, FRA's preliminary findings indicate that the UP crew applied the hand brake on the lead locomotive of the locomotive consist and then applied the independent air brake. The crew then released the independent brake to verify that the hand brake would hold, which it appeared to do. Sometime later, after the locomotive consist was left unattended, it is believed that the air brakes eventually leaked off and that the single hand brake did not, by itself, sufficiently secure the locomotive consist, enabling it to roll out of the siding eastward and onto the main track where it collided head-on with a UP freight train.

An issue related to improperly secured rail equipment is the practice known as ''bottling the air'' in a standing cut of cars. The practice of ''bottling the air'' occurs when a train crew sets out cars from a train with the air brakes applied and the angle cocks on both ends of the train closed, thus trapping brake pipe pressure in the cut of cars they intend to leave behind. This practice has the potential of causing an unintentional release of brakes on these cars and the potential for a runaway exist. Many railroad operating rules require that a 20 pound reduction in brake pipe pressure be made when stopping a train to remove a cut of cars from the train. Thus, if the trainman closes the angle cock where the cut is to be made before pressure equalizes in the trainline, an air wave action may form which can be of sufficient amplitude to initiate an unintentional release of the brakes.

Brake pipe gradient is another factor that makes bottling the air dangerous. ''Normal Gradient'' is a term used to express the difference between the higher pressure on the front end of the train and the lower pressure on the rear end of the train, which is dependent upon brake pipe leakage and train length. Each train establishes its own normal gradient value. ''Inverse Gradients'' and ''False Gradients'' are temporary gradients which are a result of brake operations. Inverse gradients occur when a brake pipe reduction is made, temporarily making the brake pipe pressure higher on the rear of the train. The false gradient is created anytime the train brakes are set and released, thus temporarily resulting in higher than normal pressure differential between the front and rear end of the train as the brake pipe charges. Therefore, if the engineer sets and

releases a train's brakes a sufficient number of times prior to stopping to remove a cut of cars, a false gradient could be established. Even if the engineer made a 20 pound brake pipe reduction and listened for the air to stop exhausting at the automatic brake valve before giving the signal to the trainman to cut off the cars, the potential exists for an unintentional release of air brakes if the air on the cars is bottled. The false gradient could be of such magnitude, that as the trainline attempts to equalize, the higher pressure on the front end flowing to the rear will exceed the 1½ pound differential across the service piston and cause a release of air brakes. An inverse gradient can also create an unintentional release of brakes. As brake pipe pressure is reduced at the front of the train, the rear end temporarily has a higher pressure. As the trainline attempts to equalize, the front end will rise. In some circumstances, this rise could be enough to initiate a release of air brakes.

On June 5, 1998, the NTSB issued the following recommendation to FRA:

> Issue a regulation that requires the brake pipe pressure to be depleted to zero and an angle cock to remain open on standing railroad equipment that is detached from a locomotive controlling the brake pipe pressure. (R–98–17)

This recommendation was the result of NTSB's investigation of an incident that occurred on January 27, 1997, on the Apache Railway near Holbrook, Arizona. The incident involved the runaway of 77 cars down a 1.7 percent grade for 14 miles resulting in the eventual derailment of 46 cars and the release of hazardous materials. Although there were no fatalities, 150 people were evacuated from nearby residential areas. The NTSB determined that the 77 cars rolled away unattended because the conductor of the train had trapped the air in the brake system, i.e. ''bottled the air,'' which resulted in an undesired release of the brakes on the standing cars. In its recommendation the NTSB correctly noted FRA statistics show that ten accidents occurred between 1994 and 1995 which were attributable to the practice of ''bottling the air.''

The procedures proposed in paragraph (o) regarding the securement of standing equipment tend to address the issue of ''bottling air'' on such standing equipment. Paragraph (o)(2)(iii) proposes to require that when freight cars are left standing the locomotives shall be detached from the cars to allow an emergency brake application to be initiated. Thus, FRA intends to require that an emergency brake application be initiated on standing equipment whenever locomotives are removed from the consist. Consequently, the requirements proposed in this section tend to address the recommendation issued by the NTSB but may need to be further investigated when FRA begins the drafting of the final rule.

In light of NTSB's recent recommendation and based on FRA's recent issuance of Safety Advisory 97–2 and its awareness of other incidents involving improper securement of rolling equipment and the practice of ''bottling the air,'' FRA seeks comment and information regarding railroads' experience with implementing the recommended practices contained in Safety Advisory 97–2 and with regard to its procedures for securing standing equipment. Consequently, FRA seeks comment and information from all interested parties on the following:

(1) What has been the railroads' experience with implementing the recommended procedures contained in Safety Advisory 97–2? Are railroads implementing the recommendations?

(2) What operational or equipment costs would be incurred should the recommended procedures contained in Safety Advisory 97–2 be mandated in a final rule?

(3) Are there additional practices or procedures that should be addressed related to the securement of unattended rolling stock?

(4) Are there alternative methods, practices, or procedures that are currently in place or that could be implemented which would provide an equivalent level of safety to the recommended procedures contained in Safety Advisory 97–2?

(5) Are there situations where a railroad could justify not depleting the brake pipe to zero when cars are left standing and unattended?

(6) Do any railroads currently endorse the practice of ''bottling the air?'' Under what circumstances?

Paragraph (p) proposes to require that air pressure regulating devices be adjusted in accordance with the air pressures contained in the chart contained in this paragraph. The chart is very similar to that currently provided in § 232.10(n), but has been updated to include equipment that is not currently addressed by the existing chart and has been modified in accordance with the provisions contained in this proposal. FRA requests that interested parties inform FRA of any existing air pressure regulating devices that have not been included or addressed in the proposed updated chart.

Section 232.105 General Requirements for Locomotives

For the most part, this section contains general provisions related to locomotives that are either currently contained in § 232.10 or that were previously proposed in the 1994 NPRM. As discussed in detail in the general preamble portion of this document, FRA does not intend to include provisions in this proposal related to the inspection and maintenance of locomotive braking systems. FRA believes that these requirements are adequately addressed in part 229 and would only add to the complexity of this proposal and potentially cause confusion or misunderstanding by members of the regulated community. Therefore, while many of the requirements currently contained in § 232.10 are no longer necessary as they are adequately addressed in part 229, paragraphs (a) and (c) are all provisions currently contained in § 232.10 which FRA believes need to be retained. *See* 49 CFR 232.10(b), (f)(2), and (g). The only change to these provisions is that in paragraph (c) FRA proposes to require that the hand or parking brake be inspected and repaired, if necessary, at least every 368 days. FRA believes that this proposal will have little or no impact on railroads as this inspection is intended to coincide with the annual locomotive inspection required under § 229.27 and many railroads currently inspect these devices at this annual inspection. FRA believes that a thorough inspection of these devices on an annual basis is sufficient to ensure the proper and safe functioning of the devices.

Paragraph (b) proposes to require that, except for a locomotive that is ordered before January 1, 1999, and placed in service for the first time before January 1, 2001, all locomotives shall be equipped with a hand or parking brake that can be set and released manually and can hold the equipment on the maximum grade anticipated by the operating railroad. A hand or parking brake is an important safety feature that prevents the rolling or runaway of parked locomotives. The proposed requirement represents current industry practice. In the 1994 NPRM on power brakes, FRA proposed requiring that a hand brake be equipped on locomotives. *See* 59 FR 47729. FRA received several comments to that proposal suggesting that the term ''parking brake'' be added to the requirement since that is what is used on many newly built locomotives. A parking brake generally can be applied other than by hand such as spring pressure or air pressure when the

brake pipe air is depleted or by other means such as driven by an electrical motor. Parking brakes usually incorporate some type of manual application or release feature, although these features are generally more difficult to operate. FRA believes that parking brakes are the functional equivalent of a traditional handbrake and are capable of providing a similar level of security to stationary equipment. Consequently, FRA has added the term ''parking brake'' in this proposal.

In paragraph (d), FRA proposes to require that the leakage on equalizing reservoirs on locomotives and related piping be zero. The equalizing reservoir contains the controlling volume of air pressure, which is set to a desired pressure by the locomotive engineer by setting the regulating valve (also known as the feed valve) on the automatic air brake system. When the automatic brake valve handle is moved to the release position, air supplied from the locomotive air compressor and the main air reservoirs is supplied to the equalizing reservoir through the regulating valve. The brake pipe pressure will then charge to the air pressure contained in the equalizing reservoir. When an application of the train brakes is desired, the engineer moves the automatic brake valve handle into the application zone. The movement of the brake valve handle into the application zone shuts off the supply of air to the equalizing reservoir being supplied from the regulating valve, leaving the volume of air contained in the equalizing reservoir trapped in the equalizing reservoir. The trapped air pressure can then be reduced to a desired amount by movement of the automatic brake valve handle. This will result in the brake pipe pressure responding and being reduced to a pressure equal to the pressure contained in the equalizing reservoir. Furthermore, the air pressure in the brake pipe on most freight equipment will be maintained at the pressure in the equalizing reservoir due to the maintaining features of the brake system. Consequently, any leakage from the equalizing reservoir will effect the maintaining feature of the automatic air brake resulting in the engineer losing his ability to effectively maintain control of the brake pipe pressure and thus, affect the ability of the engineer to safely control the train in some circumstances.

In paragraph (e), FRA proposes to prohibit the use of ''feed or regulating valve braking,'' in which reductions and increases in the brake pipe pressure are effected by manually adjusting the feed valve. ''Feed valve braking'' has been recognized by both the railroad industry and FRA as an unsafe practice. Most railroads already have some type of operating rule prohibiting this type of braking.

In paragraph (f), FRA also proposes to prohibit the use of the ''passenger'' position on the locomotive brake control stand on conventional freight trains when the trailing equipment is not designed for graduated brake release. The ''passenger'' position was intended only for use with equipment designed for graduated brake release. Therefore, use of the ''passenger'' position with other equipment can lead to potentially dangerous situations where undesired release of the brakes can easily occur due to the slightest movement of the automatic brake valve. In FRA's view, the only situation when the use of the passenger position might become necessary to safely control a train is when equalizing reservoir leakage occurs en route. If such a situation arises the train may move only to the nearest forward location where the equalizing reservoir leakage can be corrected.

Section 232.107 Air Source Requirements

This section contains proposed requirements directed at ensuring that freight brake systems are devoid, to the maximum extent practical, of water and other contaminates which could conceivably deteriorate components of the brake system, and thus, negatively impact the ability of the brake system to function as intended. As part of the Working Group proceedings, a task force was formed and charged with identifying the source of contaminates in the trainline and to determine the degree to which these contaminates pose a safety, operational, and/or maintenance problem. The task force performed tests on numerous locomotives and yard air plants, with and without air dryers, to determine the amount of dew point depression in the air lines. The results of these tests confirmed the assumptions of the Working Group members in that the vast majority of locomotives tested did not contribute to moisture in the train air lines, but rather, the main source of raw water came from yard charging devices. Further, the majority of the yard devices which were tested were relatively old and had not been properly maintained or upgraded in years. During the task force tests, it was noted that all units equipped with properly maintained air dryers produced minimal moisture in the system. Since a large number of trains are charged by yard air sources (up to 80 percent by some estimations), the group provided a non-consensus recommendation that yard air charging devices be given the greatest priority.

Based on the work performed by the task force and on FRA field experience, FRA agrees with the above conclusion and believes that requiring locomotives to be equipped with air dryers would provide minimal safety benefits and would impose an enormous and unwarranted cost burden on the railroads. Further, FRA believes that simply requiring that yard air sources be equipped with air dryers may not alone necessarily effectuate the desired results unless the air dryers are appropriately placed to sufficiently condition the air source. Many yard air sources are configured such that a single air compressor services several branch lines used to charge train air brake systems, and as such, multiple air dryers may be required to eliminate the introduction of wet air into the brake system. FRA believes that, as with locomotives, requiring yard air sources to be equipped with air dryers will likely impose a significant and unnecessary cost burden on the railroads. Thus, FRA proposes in paragraphs (a)(1)–(5) to require a monitoring program designed to ensure that yard air sources operate as intended. FRA believes that implementation of this monitoring program as proposed represents a method by which the industry can truly maximize the benefits to be realized through air dryer technology, which all parties acknowledge has been proven to reduce the level of moisture introduced into the trainline, at a cost that is commensurate with the subsequent benefits. This proposed program requires a railroad to take remedial action with respect to any yard air sources that are found not to be operating as intended, and further proposes to establish a retention requirement with respect to records of these deficient units to facilitate the tracking and resolution of continuing problem areas.

FRA proposes additional measures to minimize the possibility of moisture being introduced into the trainline. Paragraph (b) of this section reiterates the current requirement contained at § 232.11(d) which requires that condensation be blown from the pipe or hose from which compressed air is taken prior to connecting the yard air line or motive power to the train. As an additional precaution, paragraph (d) of this section proposes to require yard air reservoirs be equipped with an operable automatic drain system, or be manually drained at least once each day that the devices are used or more often when moisture is detected in the system.

In paragraph (c) of this section, FRA proposes to ban the use of anti-freeze chemicals in train air brake systems, reiterating the position stated in the 1994 NPRM, in order to prevent the untimely damage and wear to the brake system components. *See* 59 FR 47728. FRA did not receive any adverse comments on this issue in response to the previous NPRM, and both rail labor and management representatives had agreed on this provision as a consensus item prior to the discontinuance of Working Group deliberations in December 1996. FRA intends to closely monitor compliance with this provision, as recent field experience indicates that alcohol is still being used to combat moisture build-up in brake pipes, especially in extremely cold weather operations. As the majority of railroads providing comments on this issue have stated that they are able to operate trains in cold weather without resorting to the use of chemicals as an anti-freeze, railroads are not expected to incur any operational or economic hardships as a result of this requirement.

FRA recently published a final rule mandating the incorporation of two-way EOTs on a variety of freight trains, specifically those operating at speeds of 30 mph or greater or in heavy grade territories. *See* 62 FR 278. Two-way EOTs provide locomotive engineers with the capability of initiating an emergency brake application that commences at the rear of the train in the event of a blockage or separation in the train's brake pipe that would prevent the pneumatic transmission of the emergency brake application throughout the entire train. These devices consist of a front unit, located in the cab of the controlling locomotive, and a rear unit, located in the rear of the train and attached to the brake pipe. Radio communication between the front and rear end units is continually monitored and confirmed at regular intervals, and the rear unit is only activated when continuity of these radio transmissions is not maintained over a specified time interval. This discussion of two-way EOTs is particularly appropriate within the context of the air source requirements. In the unlikely event that the proposed requirements regarding dry air fail to sufficiently eliminate moisture from the trainline, and a restriction or obstruction in the form of ice forms as the result of freezing of this moisture during cold weather operations, the two-way EOT device becomes a first order safety device and will initiate an emergency application of the brakes from the rear of train. As such, the vast majority of concerns associated with moisture in the trainline freezing in cold weather operations have been alleviated through the incorporation of this technology in most freight operations.

Paragraph (e) proposes to require that railroads develop and implement detailed written operating procedures tailored to the equipment and territory of that railroad to cover safe train operations during cold weather situations. In 1990, the NTSB in response to an accident which occurred in Helena, Montana, recommended that FRA amend the power brake regulations to require additional testing of air brake systems when operating in extreme cold weather, especially when operated in mountain grade territory. *See* NTSB Recommendation R–89–081 (February 12, 1990). In response to this recommendation and to various petitions for rulemaking requesting similar action, FRA in the 1994 NPRM proposed various requirements regarding cold weather operations, which included: Use of two-way EOTs; prohibition on the use of alcohol in trainlines; air dryers on locomotives; and requirements for railroads to develop operating procedures in cold weather and mountain grade territories. As noted previously, a final rule regarding the use of two-way EOTs has been issued and is in effect. The current proposal reiterates the prohibition on the use of anti-freeze chemicals and proposes other requirements to ensure that dry air is being added to brake systems. This paragraph reiterates the previously proposed requirement that railroads develop and implement operating requirements for cold weather operations.

FRA recognizes that in the past there has been little support for mandating additional brake system testing in cold weather territory. FRA agrees that the development and use of welded pipe fittings, wide-lip hose couplings, and ferrule clamps have greatly reduced the effects of cold weather on the air brake system. However, FRA believes that cold weather situations do involve added safety risks and need to be further addressed. FRA believes that requiring the development of written operating procedures will require railroads to go through the thought process necessary to analyze their operations during cold weather conditions in order to determine the inherent safety hazards involved and develop procedures to minimize those hazards. Due to the unique nature of each railroad and the difficulty in developing specific requirements that are applicable to all operations, FRA does not intend to mandate specific operating requirements at this time. However, FRA might consider mandating specific operating requirements that should be included in any railroad's cold weather operating practices at the final rule stage based on the comments received and on FRA's continuing review of cold weather operations by various railroads.

FRA recognizes that some railroads have already developed certain cold weather operating procedures which might be useful as models on other similarly situated railroads. For example, BNSF has unilaterally instituted a cold weather operating plan for certain trains at specific locations in Montana. This plan requires trains with greater than 100 tons per operative brake to be inspected and/or operated in a certain manner when temperatures fall below zero degrees. Part of the plan requires that after the performance of a 1,000-mile or initial terminal brake test on such trains, the brakes be reset and held for 30 minutes after which time the train is to be reinspected to ensure that 100% of the brakes remained applied. Brakes found not to have remained applied must be set-out of the train or repaired. FRA believes procedures such as these could greatly enhance the safety of the trains operated in cold weather conditions. FRA recognizes that there may be other types of operating or inspection criteria that could be implemented in extreme cold weather conditions instead of or in addition to that noted above; such as limits on the length or tonnage of such trains; limits on the use of yard air sources; or other enhanced inspection criteria.

In an effort to further develop and evaluate this proposal, FRA seeks comments from all interested parties regarding the following specific issues:

(1) How many yard sources are there that are used to charge train air brake systems?

(2) What time period will be required to effectively institute the monitoring program as prescribed?

(3) How many of these yard air sources are equipped with automatic drain valves?

(4) If the yard air source is not equipped with an automatic drain valve, how long does it take to drain manually?

(5) What operating procedures do railroads currently have in place to address the added safety risks that are inherent to cold weather operations?

(6) What has been the impact on the railroad operations that have adopted cold weather procedures similar to those noted above?

(7) Are there certain cold weather operating practices and procedures that

have been adopted by most segments of the industry?

(8) FRA is aware that at least one railroad is currently engaged in the testing and tear-down of certain brake valves to ensure that the valves operate properly in cold weather. What has been the results of these tests?

Section 232.109 Dynamic Brake Requirements

This section contains the proposed operating requirements for trains equipped with dynamic brakes. Most, if not all, of the railroads have provided comments stating that they do not consider dynamic brakes to be a safety device. However, these same commenters stated that they promote and encourage the use of dynamic brakes for purposes of fuel efficiency and to avoid wear to brake components. Due to this encouragement, dynamic brakes are relied on to control train speed and to provide assistance in controlling trains on heavy grades. Contrary to continued comments of several labor representatives, FRA does not feel that locomotives should be required to be equipped with dynamic brakes. FRA believes that the decision to equip a locomotive with dynamic brakes is mainly an economic one, best determined by each individual railroad. However, in order to prevent accidents and injuries that may result from an over-reliance on the dynamic brake, which may fail at any time, FRA believes that if the devices are available, engineers should be informed on their safe and proper use and be provided with information regarding the amount of dynamic braking power actually available on their respective trains. FRA believes that by providing an engineer with as much information as possible on the status of the dynamic brakes on a train, a railroad better enables that engineer to operate the train in the safest and most efficient manner.

Based on the preceding discussion, paragraphs (a) and (c) of this section delineate specific proposed communication requirements regarding the status of the dynamic brakes on all locomotive units in a consist to ensure that locomotive engineers are provided with a clear indication of the total available braking effort at their disposal. FRA proposes to require written notification of the operational status of the dynamic brakes on all locomotive units in the consist be provided to the locomotive engineer at the initial terminal or point of origin for a train or at other locations where a locomotive engineer first takes charge of a train. Further, FRA believes that this information should include a clear, written method of communicating to a locomotive engineer that the locomotive or locomotives in his or her consist has been discovered to have inoperative dynamic brakes. Accordingly, FRA proposes that a tag bearing the words ''inoperative dynamic brake'' be securely attached and displayed in a conspicuous location in the cab of the locomotive at the point where the defective condition(s) are discovered.

Locomotive engineers have long advocated the philosophy, ''If it is equipped, then it should work'' with respect to dynamic brakes. There are currently no requirements governing the maintenance and repair of locomotives equipped with dynamic brakes. Experience has shown that, since railroads do not consider dynamic brakes to be a critical safety item, repairs are typically effectuated when it is convenient and economical for the railroad with little regard for timeliness. FRA believes that, as railroads have become increasingly dependent on the use of dynamic brakes as an integral part of their published safe train handling procedures, it is a reasonable expectation on behalf of locomotive engineers to have operable dynamic brakes on those locomotive units which are so equipped. Consequently, in paragraph (b) FRA proposes to require that all inoperative or ineffective dynamic brakes be repaired within 30 days of becoming inoperative or at the locomotive's next periodic inspection, whichever occurs first. FRA believes that this proposed maintenance requirement strikes an appropriate balance between the operational considerations important to the locomotive engineer and the logistical and repair considerations that will be imposed on the railroads.

FRA acknowledges that some railroads, primarily short lines, may own locomotives that are equipped with dynamic brakes but due to the physical terrain over which the railroad operates or the operating assignments of the particular locomotive, the railroad rarely, if ever, has the need to employ the dynamic braking capabilities of the individual locomotive. In these instances, the maintenance requirements discussed above become unnecessarily burdensome. Therefore, FRA believes relief is warranted in these situations provided a specified set of parameters is developed and adhered to that prevents direct and intentional circumvention of the proposed repair requirements. Consequently, in paragraph (d) of this section, FRA proposes to permit a railroad to declare a locomotive's dynamic brakes ''deactivated'' if the following requirements are met: (i) the locomotive is clearly stencilled on both the interior and exterior of the locomotive stating that the dynamic brake has been deactivated; and (ii) the railroad has taken appropriate action to ensure that the deactivated locomotive is incapable of utilizing dynamic braking effort to retard or control train speed. FRA does not intend to prescribe the specific manner in which the locomotive is to be deactivated, so long as the unit is not physically capable of employing its dynamic brakes to aid in train handling. Although, FRA does not envision a significant number of instances where a locomotive which has been declared ''deactivated'' would need to be ''reactivated,'' FRA does recognize that some railroads may need to reactivate the dynamic brakes in some circumstances, such as changes in a locomotive's operating environment or situations where a locomotive with previously ''deactivated'' dynamic brakes is purchased by another railroad. However, FRA intends to interpret the provision for ''deactivating'' a locomotive's dynamic brakes rather literally to minimize contentions that railroads are merely playing a cat and mouse game with the proposed maintenance interval to avoid repairing the units.

The operating requirements contained in this section attempt to address the controversy over the role of dynamic brakes in overall train safety. Most railroads commented that dynamic brakes are a secondary system that plays no role in train safety. However, many railroads have become somewhat dependent on dynamic brakes for normal train handling procedures, and this dependency gives rise to the likelihood of overreliance. Therefore, in paragraph (e) FRA proposes to require that railroads using dynamic brakes have written operating requirements governing how dynamic brakes are to be used to safely handle trains based on the operating conditions and the territory covered by that railroad. FRA intends for these operating requirements to sufficiently cover the loss of dynamic brakes or other non-friction brakes and must be fundamentally based on the use of friction brakes to safely stop a train under all operating conditions. Furthermore, in paragraph (f) FRA proposes to require each railroad to ensure that its locomotive engineers are fully trained in the operating rules prescribed above by including them in the certification process contained in the knowledge, skill, and ability requirements contained in 49 CFR part 240.

FRA believes that the establishment of these comprehensive operating rules and training plans is the most effective means by which to minimize the possibility of future accidents caused by excessive reliance on dynamic brakes by the train crew as a method of controlling the speed of a train in its descent through a difficult grade, as was the case in the San Bernardino incident. FRA views as unfortunate, and potentially reckless, the increasing number of train handling and power brake instructions issued by freight railroads that emphasize the use of dynamic brakes without including prominent warnings that such systems may not be relied upon to provide the margin of safety necessary to stop short of obstructions and control points or to avoid overspeed conditions. Such instructions, while not misleading to seasoned locomotive engineers, threaten to overcome the good judgement of safety critics and regulators by leading to excessive reliance upon these systems. Given the ever-increasing weight and length of freight trains, and the severe grades that they are often required to negotiate en route, the need for locomotive engineers who are thoroughly trained and knowledgeable in all aspects of train handling is paramount for continued safety in the rail industry.

Only limited information regarding the technical feasibility, availability, and cost of incorporating dynamic brake indicators and/or displays in the locomotive cab has been provided to the FRA in response to questions posed in the ANPRM and the 1994 NPRM. *See* 57 FR 62555 and 59 FR 47687. FRA recognizes that the technology for dynamic brake displays with the ability to provide information regarding the total train dynamic brake retarding force, at certain speed increments, in the cab of the locomotive has not been developed for industry-wide implementation on a cost-effective basis at this time. At the same time, FRA maintains that such an indicator would provide great benefits to engineers in alerting them to diminished or excessive dynamic braking capabilities, thus permitting the engineer to control the braking of their train in the safest possible manner. Previous discussions regarding the capabilities and limitations of dynamic brakes provided in the ANPRM, the 1994 NPRM, and the preamble to this NPRM have clearly shown that in order to completely test the functioning of dynamic brakes the train must be moving. However, these discussions have also clearly concluded that while running tests of dynamic brakes provide information to the locomotive engineer regarding the availability of dynamic brakes, such tests are limited to the specific moment they are performed. Thus, running tests do not provide continuous information on the current status of the dynamic brakes to the locomotive engineer. Because dynamic brakes could fail at any time, FRA feels there is merit in the development of technology whereby engineers are able to continuously monitor the operation of their available dynamic brakes. FRA once again seeks comments from all interested parties regarding the following specific issues:

1. What is the status on the future availability of dynamic brake indicators capable of providing the information discussed above?
2. What are the current cost estimates associated with the acquisition and installation of such indicators?
3. What quantitative and/or qualitative operational or safety benefits can be derived from the use of these dynamic brake indicators?
4. What alternative methods are available for providing the same information that a dynamic brake indicator would provide to a locomotive engineer?

FRA also specifically solicits input regarding the placement of a locomotive in a consist that has been declared ''permanently disabled'' in accordance with section 232.111(d) of this proposal. Some existing railroad operating rules dictate that a locomotive which has been determined to have inoperative dynamic brakes may be dispatched in a train, but prohibit its placement in the lead position of the consist. Are there technical reasons to prohibit a locomotive with inoperative dynamic brakes from functioning as the lead locomotive, *provided* the disabled locomotive still has the capability to fully control the dynamic braking functions of all other locomotives in the consist that are so equipped?

Section 232.111 Train Information Handling

This section contains the proposed requirements regarding the handling of train information. The purpose of these train-information handling requirements is to ensure that train crews are given accurate information on the condition of the train brake system and other factors that affect the performance of the train brake system when they assume responsibility for the train. This section contains a list of the specific information FRA proposes to require railroads to furnish train crew members about the train and the train's brake system at the time they take over the train. FRA believes that train crews need this information in order to avoid potentially dangerous train handling situations and to be able to comply with various Federal safety standards. Most railroads already provide their train crews with most of the information required in this proposal or have a process set-up which is capable of transmitting such information, thus the impact of this proposed requirement should be relatively minor.

It should be noted that, FRA has left the method in which railroads will convey the required information to the train crews to the discretion of the railroad since FRA feels that each individual railroad is in the best position to determine the method in which to dispense the required information based on the individual characteristics of its operations. However, the means for conveying the required information will be part of the written operating requirements, and railroads will be required to follow their own requirements.

Subpart C—Inspection and Testing Requirements

Section 232.201 Scope

This section contains the general statement regarding the scope of this subpart, indicating that it contains the inspection and testing requirements for brake systems used in freight and other non-passenger trains. This section also indicates that this subpart contains the general training requirements for railroad and contract personnel used to perform the inspection and tests required by this part.

Section 232.203 Training Requirements

This section contains the proposed general training requirements for railroad employees and contractors that are used to perform the inspections required by this part. (See ''Discussion of Issues and General FRA Conclusions'' portion of the preamble under the heading ''V. Training and Qualifications of Personnel'' for a detailed discussion pertaining to the provisions contained in this section).

Paragraph (a) proposes that each railroad develop and implement a training, qualification, and designation program for employees and contractors that perform train air brake system tests and maintenance. For purposes of this section, a ''contractor'' is defined as a person under contract with the railroad or car owner or an employee of a person under contract with the railroad or car owner. FRA intends for the proposed training and qualification requirements to apply not only to railroad personnel

but also to contract personnel that are responsible for performing brake system inspections, maintenance, or tests required by this part. FRA believes that railroads are in the best position to determine the precise method of training that is required for the personnel they elect to use to conduct the required brake system inspections, tests and maintenance. Although FRA provides railroads with broad discretion to develop training programs specifically tailored to the type of equipment it operates and the personnel it employs, FRA will expect railroads to fully comply with the training and qualification plans they develop. A critical component of this training will be making employees aware of specific Federal requirements that govern their work. Currently, many railroad training programs fail to distinguish Federal requirements from company policy.

Paragraph (b) proposes a series of general requirements or elements which must be part of any training and qualification plan developed and implemented by a railroad. FRA believes that the elements contained in this section are specific enough to ensure high quality training while being sufficiently broad to permit a railroad to develop a training plan that is best suited to its particular operation. This paragraph requires railroads to identify the specific tasks related to the inspection, testing and maintenance of the brake systems operated by that railroad, develop written procedures for performing those tasks, identify the skills and knowledge necessary to perform those tasks, and specifically identify and educate its employees on the Federal requirements contained in this part related to the performance of those tasks. FRA believes that these requirements will ensure that, at a minimum, the railroad surveys its entire operation and has identified the various activities its employees perform. FRA intends for these written procedures and the identified skills and knowledge to be used as the foundation for any training program developed by the railroad.

This paragraph also makes clear that railroads are permitted to train employees only on those tasks that they will be responsible for performing. FRA tends to agree with several railroad commenters that there is no reason for individuals who solely perform pre-departure air brake tests and inspections to be as highly trained as a carman or other mechanical personnel since these individuals perform many other duties which involve the maintenance and repair of equipment in addition to brake inspections. This paragraph also permits railroads to incorporate an already existing training program, such as an apprenticeship program. Thus, railroads would most likely not need to provide much additional training, except training specifically addressing the requirements contained in this part and possibly refresher training, to its carmen forces that have completed an apprentice program for their craft.

This paragraph also contains requirements that any program developed must include ''hands-on'' training as well as classroom instruction. FRA believes that classroom training by itself is not sufficient to ensure that an individual has retained or grasped the concepts and duties explained in a classroom setting. In order to adequately ensure that an individual actually understands the training provided in the classroom, some sort of ''hands-on'' capability must be demonstrated. FRA believes that the ''hands-on'' portion of the training program would be an ideal place for railroads to fully involve its labor forces in the training process. Appropriate trained and skilled employees would be perfectly suited to provide much of the ''hands-on'' training envisioned by FRA. Consequently, FRA strongly suggests that railroads work in partnership with their employees to develop a training program which utilizes the knowledge, skills, and experience of the employees to the greatest extent possible.

FRA does not intend to issue specific experience, classroom training, or ''hands-on'' training guidelines. FRA agrees that many of the guidelines contained in the preamble to the 1994 NPRM were overly restrictive and may have impeded the implementation of certain training protocols capable of achieving similar results with less emphasis on solely the time spent in the training process. Furthermore, the guidelines contained in the 1994 NPRM failed to adequately consider the potentially narrow scope of training that might be required for some employees, particularly some train crew personnel, that perform very limited inspection functions on very limited types of equipment. Although the training and qualification requirements currently proposed continue to require that any training provided include classroom and ''hands-on'' training as well as verbal or written examinations and ''hands-on'' capability, they do not mandate a specific number of hours that this training must encompass as that will vary depending on the employee or employees involved, which is probably best determined by the railroad.

This paragraph specifically proposes that employees pass either a written or oral examination covering the equipment, tasks, and Federal regulatory requirements for which they are responsible as well as requiring that each individual deemed qualified demonstrate ''hands-on'' capability. This paragraph makes clear that a person's ''hands-on'' capability is to be demonstrated by having the person successfully perform all of the tasks required to be performed as part of the duties for which they are being qualified in the presence of a supervisor or a designated instructor. FRA believes that in order for a person to be adequately trained to perform a task that individual must not only possess the knowledge of what is required to be performed but also must possess the capability of applying that knowledge to the actual performance of the task. Consequently, FRA proposes that the physical capability to perform the task be demonstrated by the individual in the presence of the person's supervisor or instructor.

This paragraph also contains proposed provisions for conducting periodic refresher training and supervisor oversight of an employees performance once training is provided. FRA believes both these requirements are essential to ensure that an individual continues to possess the knowledge and skills necessary to continue to perform the tasks for which the individual is assigned responsibility. Furthermore, employees must be periodically retrained in order to keep up with technological advances relating to braking systems that are constantly being made by the industry.

Paragraph (c) proposes to require that each railroad which operates trains required to be equipped with two-way EOTs develop and implement a training program which specifically addresses the testing, operation, and maintenance of the devices. The final rule requiring the use of two-way EOTs became effective on July 1, 1997. Since that time, FRA has discovered numerous operating and mechanical employees which do not fully understand when the devices are required or how the inspection and testing of the devices is to be accomplished. Furthermore, FRA believes that it is vital for those employees responsible for the use of the devices (i.e. engineers and conductors) to be intimately familiar with the use and operation of the devices to ensure that the full safety potential of the devices is utilized and available. Consequently, FRA believes that adequate training must be provided to those employees responsible for the inspection, testing, operation and use of two-way EOTs.

Paragraph (d) contains the proposed requirements related to maintaining adequate records for establishing that individuals are capable of performing the tasks for which they are assigned responsibility. FRA believes that the proposed record keeping and notification requirements contained in this paragraph are the cornerstone of the training and qualification provisions. As FRA is not proposing specific training curriculums or specific experience thresholds, FRA believes that these record keeping provisions are vital to ensuring that proper training is being provided to railroad personnel. FRA believes these requirements provide the means by which FRA will judge the effectiveness and appropriateness of a railroad's training and qualification program. These provisions also provide FRA with the ability to independently assess whether the training provided to a specific individual adequately addresses the tasks for which the individual is deemed capable of performing and will most likely prevent potential abuses by railroads to use insufficiently trained individuals to perform the necessary inspections, tests, and maintenance required by this proposal. This paragraph makes clear that FRA intends to require that railroads maintain specific personnel qualification records for all personnel (including contract personnel) responsible for the inspection, testing, and maintenance of train brake systems. This paragraph also makes clear that the records maintained by a railroad contain detailed information regarding the training provided as well as detailed information on the types of equipment the individual is qualified to inspect, test, or maintain and the duties the individual is qualified to perform. Furthermore, this paragraph requires that records maintained by the railroad contain a description of the employee's ''hands-on'' performance of the tasks for which the employee is assigned and the basis for finding that the tasks were successfully completed. Most Class I and larger Class II railroads already keep records of this type in some fashion; however, they are not always easily obtained by FRA. As an additional means of ensuring that only properly qualified individuals are performing only those tasks for which they are qualified, FRA also proposes to require that railroads promptly notify personnel of changes in their qualification status and specifically identify the date that the employee's qualification ends unless refresher training is provided.

Paragraph (e) proposes to require that each railroad adopt and comply with an internal audit process of their training, qualification, and designation program. The internal audit process should ensure that all necessary training is being conducted and documented. The audit process should be designed to evaluate the effectiveness of the training program. FRA believes that the audit process should not only review the completeness and accuracy of the certification but should also review the content and presentation of materials, the testing and grading of the employees, and the effectiveness of the classroom and ''hands-on'' portions of the training program. FRA further believes that any auditing of a training program must involve all segments of the workforce involved in the training. Thus, FRA believes it is vital that labor be intrinsically involved in the auditing process, from beginning to end. Evaluation of training techniques might best be approached through a ''team'' method, where several observers, including labor representatives, periodically evaluate course or ''hands-on'' training content and presentation. FRA believes that the consistency, effectiveness, and quality of the classroom, ''hands-on'', and refresher training should be an essential part of any internal audit process developed by a railroad.

FRA recognizes that some railroads will be forced to place a greater emphasis on training and qualifications than they have in the past, and this requirement will result in additional costs for those railroads. However, the proposed rule allows the railroads the flexibility that they need to provide only that training which an employee needs for a specific job. The proposed rule does not require an employee who only performs brake inspections while en route (i.e., Class II brake tests) to receive the intensive training needed for an employee who performs Class I brake tests or one who is charged with the maintenance or repair of the equipment. The training can be tailored to the specific needs of the railroad. Across the industry as a whole, this proposal will not require extensive changes in the way most railroads currently operate, but it will require some railroads to invest more time in the training of their personnel and should prevent railroads from using minimally trained and unqualified people to perform crucial safety tasks. In order to further assess the impact these proposed requirements will have, particularly on smaller railroads, FRA requests comments from interested parties on the following:

1. What is the potential impact of the proposed training and qualification requirements on short line railroads (i.e., Class II and Class III railroads)? How will these types of railroads meet the proposed requirements?

2. What is the potential impact of the proposed record keeping requirements to smaller railroads (i.e., Class III railroads)? Do these railroads currently maintain some sort of training records?

3. As FRA believes these records are a key element of the proposed training and qualification requirements, are there alternative methods available to smaller railroads (i.e., Class III railroads) for maintaining and developing the required information?

4. Currently, what percentage of employees will require additional training?

5. With the exception of training directed specifically at the provisions of these revised regulations, are there a sufficient number of ''qualified'' employees at present to ensure that no operational difficulty will result? What is a reasonable timeline for permitting railroads (particularly smaller railroads) to reach full compliance with regard to these requirements?

Section 232.205 Class I Brake Test—Initial Terminal Inspection

This section describes the circumstances that would mandate the performance of a Class I brake test and outlines the tasks that must be performed when performing this inspection. Most of the provisions contained in this section are currently contained in § 232.12(a) and (c)–(h) but FRA has modified the provisions to some extent in order to clarify existing requirements, to eliminate potential abuses, and to standardize certain provisions. Basically a Class I brake test is intended to be the functional equivalent to what is currently referred to as an initial terminal brake inspection.

Paragraph (a) proposes to identify those trains that are required to receive a Class I brake test prior to further movement. The provisions contained in this paragraph are similar to those currently contained in § 232.12(a), but have been somewhat expanded upon. Paragraph (a)(1) requires that trains receive a Class I brake test at the location where they are originally assembled. For clarity purposes, FRA will consider a location to be a place where a train is originally assembled, to be the location where a vast majority of the cars in a train are added to the train. FRA has discovered that some railroads are assembling two or more locomotives together with only a few cars at one location and performing an initial terminal inspection pursuant to § 232.12 on the train at that location. The train

is then moved a very short distance (less than 20 miles) where a large number of cars are added to the train with the performance of only an intermediate brake inspection being performed. FRA believes this practice is clearly an attempt to circumvent the inspection requirements currently contained in the regulations. FRA intends to make clear that it will consider that location where the majority of the cars are added to the train to be the point of origin or initial terminal for that train, as that is the location where the train is in fact assembled. FRA recognizes that such a standard will have to be looked at on a case-by-case basis, but believes that the above mentioned scenario is a clear case where a railroad is attempting to avoid the comprehensive inspection requirements imposed on a train at its point of origin.

FRA has also attempted to clarify the provision requiring the performance of a Class I brake test when the train consist is changed other than adding or removing a solid block of cars. Currently, there appears to be some confusion over what constitutes a ''solid block of cars.'' Therefore, FRA has included a definition of the term in this proposal and references it in paragraph (a)(2). FRA believes that the definition provided in this proposal is consistent with longstanding agency interpretation and the clear intent of the regulations. This definition makes clear that the phrase ''solid block of cars'' is intended to describe a set of cars that were all a part of one train and that have remained coupled together until added to another train. The phrase was never intended, nor is it intended in this proposal, to mean groups of cars removed from various different trains that are then assembled into a block for addition into another train. In FRA's view, the above described action constitutes the assembling of a new train which would require the performance of a Class I brake test.

In paragraph (a)(3) incorporates FRA's longstanding administrative interpretation which permits trains to remain disconnected from a source of compressed air (''off air'') for a short length of time without having to be retested. Currently, FRA only permits trains to remain ''off air'' for a period of approximately 2 hours before an initial terminal brake inspection must be performed. In this paragraph, FRA proposes to extend the permissible time ''off air'' to 4 hours. FRA agrees that our longstanding administrative interpretation was established prior to the development of new equipment that has greatly reduced leakage problems, such as welded brake piping and fittings and ferrule-clamped air hoses. However, contrary to several railroads' assertions FRA does not believe that cars should be allowed to be off air for extended periods of time without being retested. FRA believes that the longer cars sit without air attached the greater the chances are that the integrity of the brake system will be compromised. The longer cars sit the more susceptible they may be to weather conditions or even vandalism, as some commenters suggested. Consequently, based on today's equipment, operating practices, and overriding safety concerns, FRA feels that cars should not be disconnected from a continuous supply of pressurized air for longer than four hours without being retested. FRA also believes that the source of compressed air must be sufficient to maintain the integrity of the brake system. Consequently, FRA proposes to require that the source of compressed air be maintained at a minimum level of 60 psi.

Paragraph (a)(4) contains the proposed requirement that a train receive a Class I brake test whenever it has traveled 3,000 miles since receiving its last Class I brake test. This proposed revision is aimed at ensuring that unit trains or captive service trains receive a quality brake inspection at least every 3,000 miles. Under the current regulations certain trains can operate almost indefinitely on only one initial terminal brake inspection and then a continuing series of 1,000-mile brake inspections since the trains are rarely broken up and are not interchanged with other railroads. FRA proposes this requirement in order to ensure that these trains are not continuously operated with only a series of Class IA brake tests being performed. FRA believes that the 3,000 mile limit strikes an appropriate balance as it will continue to permit railroads to operate trains distances they currently operate without requiring the conduct of an additional Class I brake test but will ensure that unit trains and captive service operations are provided a comprehensive brake inspection on a periodic basis.

Paragraph (a)(5) contains the proposed provision for when trains received in interchange must receive a Class I brake test. These are similar to what is currently contained in § 232.12(a)(1)(iii); however, the current proposal contains two new provisions. FRA proposes to permit trains received in interchange to have a previously tested solid block of cars added to the train without requiring the performance of a Class I brake test. Currently, the addition of a these types of cars to a train received in interchange would require the performance of an initial terminal inspection. As long as the added block of cars has been previously tested, FRA sees no safety hazard in permitting the cars to be added to a train at an interchange location. Furthermore, FRA also proposes to permit trains which are received in interchange, and that will travel no more than 20 miles from the interchange location, to have its consist changed other than provided in paragraph (a)(5) without being required to receive a Class I brake test; provided that, any cars added to the consist at the interchange location receive at least a Class II brake test pursuant to § 232.209. Historically, FRA has not had a problem with these shorter distance trains and believes that a Class II brake test on those cars added to the train is sufficient to ensure the safety of these operations.

Paragraph (b) details the required tasks comprising a Class I brake test. A proper Class I brake test ensures that a train is in proper working condition and is capable of traveling to its destination with minimal problems en route. Specific tasks of the Class I brake test include most of the tasks currently required in initial terminal brake tests contained at § 232.12 (c)–(h) with some modification in the interest of standardization and clarity.

FRA again proposes a standardized brake-pipe reduction of 20 psi for virtually all brake inspections and tests. FRA agrees with both labor and management commenters that a standard brake-pipe reduction will simplify train brake tests and will make it easier to train workers. The 20-psi standardized reduction was suggested by both labor and management representatives and was previously proposed in the 1994 NPRM.

The brake-pipe leakage test will continue to be a valid method of qualifying brake systems. However, FRA proposes that the air flow method of testing the condition of the brake pipe become an acceptable alternate to the brake-pipe leakage test. The air flow method would only be an alternative for trains having locomotives equipped with a 26–L brake valve or equivalent and outfitted with an EOT device. The maximum allowable flow would be 60 CFM. FRA believes that the air flow method is a much more comprehensive test than the leakage test. Although FRA is not proposing to mandate the use of the air flow method, it does recommend that railroads use the method when possible, not just to qualify brake systems, but in order to provide additional information regarding the brake system to the train crew. The air

flow method has been approved for use by AAR member railroads after extensive testing, and the method has been available in Canada as an alternate means of qualifying train brakes since 1984.

The brake-pipe gradient of 15 psi has been retained for both the leakage and air flow method of train brake testing; however, the minimum rear-car pressure has been increased to 75 psi, which will require a locomotive brake-pipe pressure of 90 psi. FRA feels that the added margin of braking power justifies the increase in pressure.

Based on FRA's experience over the last several years and based on numerous comments received by FRA verifying the high reliability of the rear-car pressure transducers used in reporting brake-pipe pressure by an end-of-train (EOT) device, FRA now feels comfortable and justified in allowing the use of EOT devices in establishing the rear car pressure for Class I brake tests. FRA currently has requirements in place for the inspection and testing of EOT devices at the time of installation, which have been incorporated into subpart E of this proposal. However, in using an EOT to verify rear car pressure during a Class I brake test, the reading of the rear car air pressure is only permitted from the controlling or hauling locomotive of the train. Under no circumstances will train air brake pressure be read from a remote highway vehicle, another locomotive not attached to the train, or at any other location such as a remote unit installed in an office or shop.

FRA has proposed paragraph (b)(2) in order to clarify the duties of individuals performing brake inspection contained in this proposal. The language in this paragraph is reiterated in both the Class IA and Class II brake tests contained in this proposal in order to ensure the proper performance of brake inspections. Over the last few years there has been extensive debate concerning what constitutes a proper train air brake test under the current provisions contained in part 232, particularly relating to the positioning of the person performing the brake inspection. In early 1997, FRA issued a technical bulletin to its field inspectors in an attempt to clarify what must be done in order to properly perform a brake test. This technical bulletin stated that inspectors must position themselves in such a manner so as to be able to observe all of the movable parts of the brake system on each car. At a minimum, this requires that the inspector observe both sides of the equipment sometime during the inspection process. FRA further believes that both sides of the equipment must be observed sometime after the occurrence of activities that have the likelihood of compromising the integrity of the brake components of the equipment, such as: hump switching; multiple switching; loading; or unloading. FRA also agrees with several railroad commenters to the technical bulletin, that if one side of the equipment is inspected to ensure the proper attachment and condition of brake components and the proper condition of brake shoes on that side and the application of the brakes is observed from the other side of the equipment, then based on the design of brake systems today it can be safely assumed that in virtually every case an application of the brakes is occurring on the other side of the equipment. Consequently, FRA would like to make clear that both sides of the equipment do not necessarily have to be inspected while the brakes are applied if an adequate inspection of the brake components was conducted on both sides of the equipment sometime during the inspection process. However, FRA also intends to make clear that the piston travel on each car must be inspected while the brakes are applied; thus, an inspector must take appropriate steps to make this observation.

Similarly, paragraph (b)(4) is also an attempt to clarify language contained in the current regulation which requires that the brakes ''apply.'' This language has been misinterpreted by some to mean that if the piston applies in response to a command from a controlling locomotive or yard test device, and releases before the release signal is given, the brake system on that car is in compliance with the regulation because the brake simply applied. The intent of the regulation has always been that the brakes apply and remain applied until the release signal is initiated from the controlling locomotive or yard test device. Therefore, clarifying language has been added in this paragraph to eliminate all doubt as to what is required. Consequently, the brakes on a car must remain applied until the appropriate release signal is given. If it fails to do so the car must either be removed from the train or repaired in the train and retested as discussed below.

FRA recognizes that some defective train air brake conditions found when performing a train air brake test, which may cause insufficient application of the brakes on a piece of equipment, are of such an obvious nature they can be quickly repaired in the train. For example, a brake connection pin might be missing, a slack adjuster might be disconnected, or some other minor part of the brake system might be defective. FRA does not intend to mandate that these types of obvious defective conditions require the car to be removed from the train, if repaired. Rather, in paragraph (b)(4) FRA proposes to allow a retest from the controlling locomotive or head end of the consist if the car is repaired in the train. Furthermore, if a retest is conducted, the brakes on the retested car shall remain applied for a minimum of five (5) minutes. The five minute requirement is based on the leakage parameters established for locomotives contained at § 229.59(c).

In paragraph (b)(5), FRA will continue to require that piston travel be adjusted during the performance of a Class I brake test if it is found outside the nominal limits established for standard 8½ inch and 10-inch diameter brake cylinder or outside the limits established for other types which will be contained on a stencil, sticker, or badge plate. This provision is similar to the provision currently contained at § 232.12(f). The major difference is that FRA has modified the provision to require that piston travel found to be less than 7 inches or more than 9 inches must be adjusted nominally to 7½ inches. This change is based on a request by AAR to change the adjustment to 7½ inches from 7 inches as its member railroads were finding it extremely difficult to adjust the piston travel to precisely 7 inches and that in some cases the adjustment would be marginally less than 7 inches, thus requiring a readjustment. Thus, AAR sought the extra ½ inch in order to provide a small measure for error when the piston travel is adjusted. As FRA believes that AAR's concerns are validly placed and would have no impact on safety, FRA has accommodated the request.

In paragraph (b)(7), FRA makes clear that brake connection bottom rod supports will no longer be required on bottom connection rods secured with locking cotter keys. FRA recognizes that there is no need for bottom rod safety supports in these incidents and intends to relieve railroads of this unnecessary expense, which will provide the industry a cost savings without compromising safety.

Paragraph (b)(8) contains the provisions relating to the performance of ''roll-by'' inspections of the brake release. These types of inspections have been conducted for years even though there is nothing in the current regulation which specifically addresses the conduct. The ability to perform this type of inspection of the brake release permits railroads to expedite the

movement of trains and has not proven to be a safety hazard. Therefore, FRA proposes this provision to clarify the ability to perform such an inspection and to ensure that the inspection is performed properly. This paragraph makes clear that when performing a ''roll-by'' inspection of the brake release the train's speed shall not exceed 10 mph, that the qualified person performing the ''roll-by'' inspection shall notify the engineer when and if the ''roll-by'' has been successfully completed, and that the operator of the train will note successful completion of the release portion of the inspection on the written or electronic notification required by this proposal. FRA intends to make clear that the notification to the engineer could be made via a hand held radio, a cellular telephone, or through communication with a train dispatcher but that such information must be provided to the engineer prior to the train's departure. Based on the rationale provided for permitting only one side of a train to be inspected during the application of the brakes, FRA intends to make clear that only one side of the train needs be inspected during the release portion of a brake test.

Paragraph (c) retains the language currently contained in § 232.12(a), with slight modification for clarity, stating that a carman alone will be considered a qualified person if a railroad's collective bargaining agreement provides that carmen are to perform the inspections and tests required by this section. The original provision was added to the regulations in 1982 when the distance between brake inspections was increased from 500 miles to 1,000 miles. The provision was included as part of an agreement between the railroads and rail labor for permitting the distance between brake tests to be increased and was presented to FRA at the time. The language contained in that agreement was included in the 1982 regulatory revisions without change by FRA. Consequently, due to the circumstances under which this provision was added to the regulations and because it has existed for over 16 years, FRA feels compelled to retain the language at this time. However, FRA intends to make clear that it will interpret the language contained in this provision to mean that only in circumstances where a railroad's collective bargaining agreement specifically requires that only a carman may perform the inspections and tests required by this section, will a carman alone be considered a qualified person. FRA believes that this interpretation clarifies the meaning of the provision and provides the most reasonable, enforceable, and understandable interpretation of the requirement and is consistent with the approach to inspections envisioned in this proposal.

As FRA lacks the authority to issue binding interpretations of collective bargaining agreements, FRA lacks the ability to settle a dispute between a railroad and its employees as to which group of its employees is to perform what work. FRA intends to make clear, that in order for FRA to proceed with an enforcement action under this provision, one of the parties to the collective bargaining agreement would first have to obtain a decision from a duly authorized body interpreting the relevant agreement, specifically identifying the involved location, and adequately resolving all of the interpretative issues necessary for FRA to conclude that the work belongs to a particular group of employees.

This paragraph makes clear that in circumstances where a collective bargaining agreement requires that only carmen are to perform the inspections and tests required by this section that the railroad shall ensure that those carmen responsible for performing these tasks are properly trained and designated as qualified for the tasks they are to perform. In these circumstances FRA believes that the railroad must ensure that the employees with which they have collectively bargained to exclusively perform the inspections and tests required by this section are properly trained and designated to perform the task. Furthermore, FRA believes that on virtually all railroads carmen will be sufficiently trained and experienced to be considered ''qualified persons'' and ''qualified mechanical inspectors'' as defined in this proposal, except that they might need some additional training on the specific requirements contained in this proposal.

Paragraph (d) contains a new proposed requirement regarding written notification of the successful completion of a Class I brake test by a qualified person. Labor organizations have commented for years that when crews board trains at points of interchange, crew change points, and on main lines where the hours of service has halted a train that they have no information as to when or where the train last received a brake inspection or test. FRA has encountered this same difficulty when investigating train accidents and other incidents requiring FRA attention. FRA has found that train symbols change when trains are interchanged and that train crews do not know where their train originated, how many miles it has mileage traveled, or when the last tests and inspections were performed. Without this knowledge of a train's history, railroads and train crews cannot possibly comply with Federal regulations in many instances. Therefore, FRA has included language in this paragraph in an attempt to eliminate some these potential problems and further enhance the safety of train operations by proposing to require that the qualified person conducting the Class I brake test notify the locomotive engineer in writing, or place such notification in the cab of the controlling locomotive that the Class I brake test was successfully performed. FRA believes this information could be provided to an engineer electronically via the computer equipment currently installed on locomotives. If the information is provided by this medium, the system must be capable of identifying the qualified inspector entering the information, include all of the information required on the written notification, and be available to FRA upon request. FRA further proposes that the written or electronic notification remain in the cab of the controlling locomotive until the train reaches its destination. FRA believes that these proposed provisions will ensure that train crews are aware of the condition of their train throughout its trip and thereby enhance the safety of train operations.

Paragraph (f) is included in order to clarify existing requirements relating to the adding of cars or blocks of cars while a train is en route. This proposed paragraph informs railroads that cars picked-up en route that have not been previously tested and kept connected to a source of compressed air are to receive a Class I brake test when added to the train. Alternatively, a railroad may elect to perform only a Class II brake test at the time that a car is added to the train en route, but FRA intends to make clear that if this option is elected then the cars added in this fashion must be given a Class I brake test at the next forward location where facilities are available for providing such attention.

Section 232.207 Class IA Brake Tests—1,000-mile Inspection

This section contains the proposed requirements related to the performance of a Class IA brake test. Many of the proposed provisions contained in this section are currently contained at § 232.12(b) regarding the performance of 1,000 mile inspections. FRA has modified some of the current requirements for purposes of clarity and has added a few additional requirements in order to make the inspection requirement more

enforceable and to prevent some of the current abuses which FRA field inspectors have experienced in their enforcement activities.

Paragraph (a) provides that each train shall receive a Class IA brake test at a location that is not more than 1,000 miles from the point where any car in the train last received a Class I or Class IA brake test. FRA intends to make clear that the most restrictive car or block of cars in the train will determine the location where this test must be performed. For example, if a train departs point A and travels to point B where it picks-up a previously tested block of cars en route which has travelled 800 miles since its last Class I brake test and the crew does not perform a Class I brake test when entraining the cars, then the entire train must receive a Class IA brake test within 200 miles from point B even though that location may only be 600 miles from point A.

Paragraph (b) contains the proposed tasks which must be performed when conducting a Class IA brake test. These tasks are virtually identical to some of the tasks required to be performed during a Class I brake test. A leakage or air flow test must be performed. Thus, when locomotives are equipped with a 26–L brake valve or equivalent, FRA will permit the use of the air flow method as an alternative to the brake pipe leakage test. This paragraph is also intended to make clear that in order to properly perform an inspection under this section both sides of the equipment must be observed sometime during the inspection process. This paragraph also makes clear that the brakes shall apply on each car in response to a 20-psi brake pipe reduction and shall remain applied until a release is initiated and reiterates the parameters for performing a retest on those cars found not to have sufficiently applied that are proposed for Class I brake tests. It should be noted that defective equipment may be moved from or past a location where a Class IA brake test is performed only if all of the requirements contained in § 232.15 have been satisfied.

Paragraph (c) contains the proposed provision which would require railroads to maintain a list of locations where Class IA inspection will be performed and that FRA be notified at least 30 days in advance of any change to that list of locations. The current regulations merely require that railroads designate locations where intermediate 1,000-mile brake inspections will be performed but places no limitation on changing the locations. Therefore, FRA has found some railroads changing the locations where these intermediate inspections are to occur on a daily basis in order to prevent FRA from observing these inspections being performed or to avoid full performance of the required inspection by mechanical forces. Consequently, in order to ensure that these types of inspections are being properly performed, FRA must be able to determine where the railroad plans to conduct these types of inspections. FRA recognizes that there may be occurrences or emergencies, such as derailments, that make it impossible or unsafe for a train to reach a location that the railroad has designated as a Class IA inspection site. Consequently, FRA proposes to permit railroads to bypass the 30-day written notification requirement in these instances provided FRA is notified within 24 hours after a designation has been changed. This paragraph also makes clear that failure to perform a Class IA brake test at a designated location will constitute a failure to properly perform the inspection.

Section 232.209 Class II Brake Tests—Intermediate Inspection

This section contains the proposed requirements related to the performance of Class II brake tests. The requirements proposed in this section mirror the requirements currently contained in § 232.13(d) but have been slightly modified for clarity and standardization. In paragraph (a), FRA proposes that, at a minimum, a Class II brake test be performed on all cars that are added to a train at a location that is not the train's point of origin and that have not received a Class I brake test or that have been off a source of compressed air for more than four hours. In paragraph (d), FRA makes clear that if cars are added in this fashion then they must receive a Class I brake test at the next forward location where the facilities are available for performing such an inspection.

Paragraph (b) contains the proposed tasks which must be performed when conducting a Class II brake test. A Class II brake test is intended to ensure that the brakes on those cars added apply and release and that the added cars do not compromise the integrity of the train's brake system. Therefore, a leakage or air flow test must be performed when the cars are added to the train to ensure the integrity of the train's brake system. This paragraph makes clear that in order to properly perform an inspection under this section both sides of the equipment must be observed sometime during the inspection process. This paragraph also makes clear that the brakes shall apply on each car added to the train and remain applied until a release is initiated and reiterates the parameters for performing a retest on those cars found not to have sufficiently applied that are proposed for Class I brake tests. It should be noted that, defective equipment may be moved from or past a location where a Class II brake test is performed only if all of the requirements contained in § 232.15 have been satisfied. Paragraph (b) also requires that the release of the brakes on those cars added to the train and on the rear car of the train be verified and allows railroads to conduct ''roll-by'' inspections for this purpose.

Paragraph (c) permits an alternative to the rear car application and release portion of this test. This alternative permits the locomotive engineer to rely on a rear car gauge or end-of-train device to determine that the train's brake pipe pressure is being reduced by at least 5-psi and then restored by at least 5-psi in lieu of direct observation of the rear car application and release. This alternative has been permitted for years under the current regulations without any degradation to safety, and thus, FRA intends to permit the practice to continue.

Section 232.211 Class III Brake Tests—Trainline Continuity Inspection

This section contains the proposed requirements related to the performance of Class III brake tests. The requirements proposed in this section incorporate the requirements currently contained in § 232.13(c) but have been slightly modified for clarity and standardization. The purpose of a Class III brake test is to ensure the integrity of the trainline when minor changes in the train consist occur. Basically, a Class III brake test ensures that the train brake pipe is properly delivering air to the rear of the train. FRA intends to make clear that this inspection is designed to be performed whenever the continuity of the brake system is broken or interrupted. For example, if a railroad disconnects a locomotive from a train consist to perform switching duties for a short period and then reattaches the locomotive to the consist, without any other change being made in the consist, the railroad would be required to perform a Class III brake test prior to the train's departure. Similarly, a Class III brake test would be required if a railroad disconnects a locomotive from the train and adds a different locomotive to the train, only to discover that the added locomotive is not operating properly, and thus, adds the original locomotive back into the consist. Because the continuity of the trainline was interrupted when the

locomotive was removed and then placed back in the train, even though the same cars and locomotives remained in the consist, a Class III brake test must be performed. Paragraphs (b) and (c) contain the tasks related to the performance of this brake test. The proposed tasks require an application of the brakes on the rear car of the train in response to a 20-psi brake pipe reduction and a subsequent release of the brakes on that car when initiated. Similar to Class II brake tests, paragraph (c) permits an alternative to direct observation of the application and release of the rear car's brakes by permitting the operator to rely on a rear car gauge or end-of-train device to determine that the brake pipe pressure is being reduced and restored in response to the controlling locomotive.

Section 232.213 Extended Haul Trains

This section contains the proposed provisions which would permit an extension of the allowable distance a train may travel between train brake system tests. Currently, trains are not permitted to travel more than 1,000 miles without receiving an intermediate brake inspection. *See* 49 CFR 232.12(b). FRA believes that if a train is properly and thoroughly inspected, with as many defective conditions being eliminated as possible, that the train is capable of traveling well over 1,000 miles between brake inspections. By this, FRA contends that not only must the brake system be in quality condition but that the mechanical components of the equipment must be in equally prime condition. As the distance a train is allowed to travel increases, the mechanical condition of the equipment is a key factor in ensuring the proper and safe operation of the train brake system throughout the entire trip. FRA also continues to believe that the best place to ensure the proper conduct of these inspections and to ensure that the train's brake system and mechanical components are in the best condition possible is at a train's point of origin (initial terminal).

In paragraph (a), FRA proposes to permit railroads to designate specific trains which will be permitted to move up to 1,500 miles between brake and mechanical inspections provided the railroad meets various stringent inspection and monitoring requirements, which FRA believes will ensure the safe and proper operation of these trains. FRA intends to make clear that a railroad must meet all of the requirements contained in this paragraph in order to designate a train as an extended haul train. Paragraph (a)(1) proposes that railroads must designate specific trains it intends to move in accordance with this section. This paragraph sets forth the information that must be provided to FRA in writing when designating a train for such operation. The information required to be submitted is necessary to facilitate FRA's ability to independently monitor a railroad's operation of these extended haul trains.

FRA believes that in order for a train to be permitted to travel 1,500 miles between inspections, the train must receive inspections that ensure the optimum condition of both the brake system and the mechanical components. In paragraphs (a)(2), (a)(3), and (a)(8), FRA proposes to require that these inspections be performed by highly qualified and experienced inspectors in order to ensure that quality inspections are being performed. As FRA intends the Class I brake tests that are required to be performed on these trains to be as in-depth and comprehensive as possible, FRA believes that these inspections must be performed by individuals possessing the knowledge to not only identify and detect a defective condition in all of the brake equipment required to be inspected but also possess the knowledge to recognize the interrelational workings of the equipment and the ability to trouble-shoot and repair the equipment. Therefore, in paragraphs (a)(2) and (a)(8) FRA proposes the term ''qualified mechanical inspector'' to identify and describe those individuals it believes possess the necessary knowledge and experience to perform the proposed Class I brake tests on these trains. A ''qualified mechanical inspector'' is a person with training or instruction in the troubleshooting, inspection, testing, maintenance, or repair of the specific train brake systems the person is assigned responsibility and whose primary responsibilities include work generally consistent with those functions. (See § 232.5 of the section-by-section for a more detailed discussion of ''qualified mechanical inspector.'') FRA further believes these same highly qualified inspectors must be the individuals performing the proposed inbound inspection, contained in paragraph (a)(6), on these extended haul trains in order to ensure that all defective conditions are identified at the train's destination or 1,500 mile location. Similarly, in paragraph (a)(3), FRA proposes that all of the mechanical inspections required to be performed on these trains be conducted by inspectors designated pursuant to 49 CFR 215.11, rather than train crew members, in order to ensure that all mechanical components are in proper condition prior to the trains departure.

As no trains are currently permitted to travel in excess of 1,000 miles between inspections, FRA is not willing to propose more than 1,500 miles between such inspections until appropriate data is developed which establishes that equipment moved under the proposed criteria remains in proper condition throughout the train's journey. FRA believes that the proposed provisions contained in paragraphs (a)(6)and (a)(7), requiring the performance of an inbound inspection at destination or at 1,500 miles and requiring carriers to maintain records of all defective conditions discovered on these trains for a period of one year creates the basis for developing such data. FRA believes the information generated from these inbound inspections will be extremely useful in assessing the quality of a railroad's inspection practices and will help FRA identify any systematic brake or mechanical problems that may result in these types of operations.

In paragraphs (a)(4) and (a)(8), FRA proposes that these trains have 100 percent operative brakes and contain no cars with mechanical defects under part 215 at either the train's point of origin or at the time of departure from a 1,500 point, if moving in excess of 1,000 miles from that location. Furthermore, in paragraph (a)(5) FRA proposes that these trains not conduct any pick-ups or set-outs en route, except for the removal of defective equipment. FRA believes that these two provisions are essential to ensuring the accuracy of the data being collected by the railroads as well as ensuring the proper and safe operation of these trains. FRA also believes that prohibiting pick-ups and set-out on these trains will significantly minimize the disruptions made to the integrity of the trains brake system and reduce mechanical damage that may occur during switching operations. Furthermore, there is currently no reliable tracking system available to FRA to ensure that cars added to the train en route have been inspected in accordance with the provisions contained in this section.

Paragraph (b) makes clear that failure to comply with any of the restrictions contained in this section will be considered an improper movement of a designated priority train for which appropriate civil penalties may be assessed. Thus, FRA would list specific civil penalties in the final rule pertaining to the improper movement of these types of trains. In addition to the imposition of civil penalties, FRA also makes clear in this paragraph that it reserves the right to revoke a railroad's

ability to designate any or all trains for repeated or willful noncompliance with any of the provisions contained in this section.

Section 232.215 Transfer Train Brake Tests

This section contains the proposed requirements related to the performance of transfer train brake tests. The requirements proposed in this section incorporate the requirements currently contained in § 232.13(e) but have been slightly modified for clarity and standardization. ''Transfer train'' is defined in § 232.5 as a train that travels between a point of origin and a point of destination, located not more than 20 miles apart, and which is not performing switching service. The new definitions, in § 232.5, would clearly define ''yard trains'' and would exclude them from the definition of ''transfer train.'' ''Yard train'' would be defined as a train that only performs switching service within a single yard complex. Switching movements by ''yard trains'' would not require a transfer train air brake test. However, as noted previously, a yard train or other train engaged in switching service carries the potential of becoming a transfer train, subject to a transfer train's testing requirements if the movement engaged in is considered a ''train movement'' rather than a ''switching movement.'' FRA's determination of whether the movement of cars is a ''train movement,'' subject to the requirements of this section, or a ''switching movement'' is and will be based on the voluminous case law developed by various courts of the United States. (See section-by-section for § 232.5 for a more detailed discussion of the terms ''train movement'' and ''switching movements.'')

FRA intends to make clear that a train will only be considered a transfer train if there is no more than 20 miles between the train's point of origin and point of final destination. If the train will move greater than 20 miles between the point of origin and point of final destination it cannot be considered a transfer train and a Class I brake test must be performed on the train prior to departure from its point of origin. Although cars may be added to a transfer train while the train is en route, with a transfer train brake test being performed on the cars added, the train is limited to a total of 20 miles from its point of origin, not from the location where new cars are added. The distance the entire train will move between its point of origin and point of final destination is the determinative factor in determining whether the train is a transfer train, cars dropped-off or picked-up en route do not affect this distance.

Paragraph (a) contains the proposed tasks that are required to be performed when conducting a transfer train brake test. Due to the short distance these types of trains will travel FRA will continue to permit the brake system to be charged to only 60-psi but will make clear that this must be verified by an accurate gauge or end-of-train device. Although the current regulations do not require the use of a gauge or device, FRA is at a loss to understand how an inspector can know the pressure in the brake system without getting a reading from the rear of the train. FRA will also continue to require that the brakes apply in response to a 15-psi reduction. This section contains modifications for performing a transfer train brake test. FRA believes that the reduced pressure at which this test is performed (i.e., 60-psi rather than 75-psi) requires that an application be obtained with a smaller pressure reduction than proposed for other brake tests. FRA also intends to make clear that an inspection be made to determine that the brakes on each car apply and remain applied until the release is initiated by the controlling locomotive.

This paragraph permits cars found with readily identifiable problems which causes the brakes not to remain applied, to be retested. The retest must be conducted from the controlling locomotive or head of the consist and the cars brakes must remain applied for at least 5 minutes. The reasoning for this is to assure safe train operation and handling by requiring a mandatory time frame for which the brakes shall remain applied on each car in the train. Consequently, cars whose brakes release prior to an initiation by the controlling locomotive shall either be repaired and retested or may be moved pursuant to the provisions proposed in § 232.15, if applicable.

Section 232.217 Train Brake System Tests Conducted Using Yard Air

This section proposes the requirements for performing train brake system tests when using yard air and are basically identical to the requirements currently contained in § 232.12(i) with slight modification for clarity and standardization with other provisions contained in this proposal. In paragraph (a), FRA will continue to require that the testing device be connected to the end of the train or cut of cars that will be nearest the controlling locomotive. FRA believes that if the yard test plant was connected to the rear of the train or cut of cars being tested, the possibility of an overcharge condition will exist which presents safety concerns. An overcharge condition describes a situation in which the brake equipment of cars and/or locomotives is charged to a higher pressure than the maximum brake pipe pressure that can normally be achieved in that part of the train, this may result in the locomotive engineer lacking the ability to control the application or release of the brakes at the rear of the train. FRA recognizes that some currently existing yards are designed in such a manner so that performance of a test from the front of the consist is extremely difficult or impossible. Consequently, FRA seeks comment from all interested parties addressing the following:

1. Are there potential operating or procedural restrictions that could be required which would permit the connection of the testing device to some location in the train other than the front of the consist that would alleviate overcharge concerns?

2. Are there other potential safety hazards created by permitting yard test devices to be connected to the consist at other than the end nearest the controlling locomotive?

Paragraph (b) proposes to make clear that a Class III brake test as proposed in § 232.211 must be performed on the cars at the time that the road locomotive is attached. This paragraph also remains consistent with other provisions of this proposal by requiring the yard test plant air pressure to be 80-psi, and by requiring the retesting of cars that remain disconnected from a source of compressed air for more than four hours.

Paragraph (c) proposes to require that mechanical yard test devices and gauges be calibrated every 92 days and that electronic yard test devices and gauges be calibrated annually. Based on observations made by FRA's field inspectors, FRA has some concerns regarding the condition of many yard test devices and gauges. FRA has found numerous mechanical gauges the condition of which creates serious doubt as to the accuracy of the gauge. Mechanical gauges have been found with broken or missing glass which would allow moisture and other contaminates to be present in the gauge. As many of the yard test plants being used today are portable, they are exposed to a wide array of handling and environmental hazards while being transported from location to location. Therefore, FRA proposes that mechanical devices and gauges be tested and calibrated every 92 days. Whereas, electronic gauges and devices appear to have much less exposure to many of the

hazards encountered by mechanical devices and gauges and tend to be much more reliable and accurate for a longer period of time. Consequently, FRA proposes to only require electronic yard test devices and gauges to be tested and/or calibrated on an annual basis.

Section 232.219 Double Heading and Helper Service

This section proposes the requirements related to double heading and helper service. The provisions proposed in paragraphs (a) and (b) are identical to the provisions currently contained in § 232.15, the only difference being that paragraph (a) has been slightly modified in order to clearly identify that a Class III brake test must be performed when a new locomotive is placed in control of the train. FRA believes these provisions are necessary and have been in place for years in order to ensure that locomotives taking control of a train have the ability to actually control the brakes on the train. Paragraph (c) proposes a new requirement aimed at ensuring that the brake systems on helper locomotives respond as intended to brake commands from the controlling locomotive at the time it is placed in the train. Failure of a helper locomotive to respond to the command of the controlling locomotive could result in a very serious safety hazard in that a helper locomotive may continue to push the rear of the train while the brakes are applied potentially resulting in an incident or derailment. FRA intends to make clear in this paragraph that a helper locomotive found with inoperative or ineffective brakes be repaired prior to use or removed from the train.

FRA also seeks information and comment from interested parties regarding a device being used on locomotives used in helper service on a few railroads. The device is referred to as a ''Helper Link.'' The Helper Link is an electronic device, mounted on the front end of the lead helper locomotive and is used to control the automatic air brakes on helper locomotive consists. When this device is used the train's brake pipe is not connected between the rear car of the train being pushed and the helper locomotives. The end-of-train device, attached to the rear car of the train, sends a radio signal which is received by the Helper Link device. The Helper Link device is connected to the brake pipe of the helper locomotives and an electronic command from the EOT device causes the air pressure in the helper locomotive brake pipe to be reduced or increased, thus, applying or releasing the brakes on the helper locomotives. A signal is transmitted from the EOT device to the Helper Link device at 60 second intervals to ensure communication. The Helper Link is also used to operate the uncoupling lever to detach the helper locomotives from the rear of the train without stopping the train.

Based on information currently available to FRA, it appears that when there is a loss of communication between the EOT device and the Helper Link device, the engineer of the helper locomotive consist is not immediately aware of the failure. If the communication between the EOT device and the Helper Link is not reestablished within the next 60 second communication cycle the Helper Link device will automatically disable itself. Consequently, if the train experiences an emergency application of the air brakes while the Helper Link device is disabled, the brakes on the helper locomotives would not apply and would result in the helper locomotives continuing to push under power. Furthermore, in order for communications to be reestablished between the EOT and Helper Link the engineer must leave the locomotive controls, exit the locomotive cab, and proceed to the front of the locomotive to manually press the reset buttons located on the Helper Link device itself. In addition, there are currently no regulations which address the use, testing, or calibration of these Helper Link devices.

On August 22, 1996, the UTU submitted a Petition for Rulemaking with FRA regarding Helper Link devices raising many of the concerns noted above. *See* Petition for Proposed Rulemaking Docket 96–1. In order to address the UTU petition in this rulemaking and to address the concerns of FRA noted above, FRA seeks information and comment from all interested parties on the following:

1. How many railroads are currently utilizing Helper Link devices in their operations? On how many trains?

2. What has been the operating history of the Helper Link devices on those railroads currently using the devices?

3. Is the discussion of the use and operation of the Helper Link device contained above accurate? Have technological improvements been made to the devices recently?

4. What testing, calibration, or operational procedures have been voluntarily implemented by railroads currently using Helper Link devices?

5. Can or should an audible or visual warning be provided to the engineer in the event that communication is lost between the EOT device and the Helper Link device?

6. What are the recommended testing and calibration requirements for Helper Link devices currently being used in the industry?

7. Is the technology available to permit the resetting of the Helper Link device by the engineer from his or her normal operating position, if communication is lost between the EOT and the Helper Link device?

Subpart D—Periodic Maintenance and Testing Requirements

This proposed subpart provides the proposed periodic brake system maintenance and testing requirements for equipment used in freight and other non-passenger trains. As stated in the 1994 NPRM and in the ''General Discussion of Issues'' portion of the preamble to this NPRM, FRA firmly believes that the new repair track test and single car test, which have been used industry-wide since January of 1992, are a much better and more comprehensive method of detecting and eliminating defective brake equipment and components than the old, time-based COT&S requirements. FRA believes that performance of these tests has significantly reduced the number of defective components found and has dramatically increased the reliability of brake equipment. Through the implementation of the repair track and single car tests, the safety of both railroad employees and the public has greatly improved due to brake equipment being in better and safer condition. At the same time, however, FRA is cognizant that contentions by rail labor regarding the carrier's direct and intentional circumvention of these revised requirements through the elimination of repair tracks, by moving cars to expediter tracks for repair, or simply by making repairs in the field is a legitimate concern that needs to be addressed to ensure the industry fully benefits from the advantages of the improved tests. This subpart proposes to incorporate AAR Interchange Rule 3 and Chart A into this regulation, and codify existing repair track and single car test requirements, while also imposing additional requirements that are intended to eliminate the circumvention of the requirements as discussed above.

Section 232.303 General Requirements

This section contains the general requirements regarding the maintenance, repair, and test of freight cars. Prior to the termination of Working Group deliberations, the periodic maintenance and single car test task force had conducted extensive

discussions regarding the requirements of AAR Rule 3, Chart A, specifically as they relate to the circumstances that trigger the performance of a repair track or single car test. The task force was ultimately unable to provide consensus recommendations to the Working Group on all aspects of periodic maintenance and testing requirements, due to the Working Group's inability to agree on the issues relating to data collection, evaluation, and relevance. However, based on these efforts and the discussions provided above, FRA proposes in paragraph (a) of this section to require that each freight car be maintained, repaired, and tested in accordance with the AAR's Rule 3 ''Testing of Air Brakes'' and accompanying Chart A, contained in the AAR ''Field Manual on Interchange Rules'' (January 1, 1998).

Paragraphs (b)–(d) reiterate existing general requirements currently prescribed at 49 CFR 232.17 with minor revisions for purposes of clarification and standardization. Paragraph (b) clarifies that the air brakes must remain applied until the release signal is initiated to maintain consistency with the proposed requirements stated at § 232.205(b)(4). Paragraph 232.205(b)(4) is an attempt to clarify language contained in the current regulation which require that the brakes ''apply.'' This language has been misinterpreted by some to mean that if the piston applies in response to a command from a controlling locomotive or yard test device, and releases before the release signal is given, the brake system on that car is in compliance with the regulation because the brake simply applied. The intent of the regulation has always been that the brakes apply and remain applied until the release signal is initiated from the controlling locomotive or yard test device. Therefore, clarifying language has been added in this paragraph to eliminate all doubt as to what is required. Consequently, this paragraph makes clear that the brakes on a car must remain applied until the appropriate release signal is given. If it fails to do so, the car must be repaired and retested.

Paragraph (c) proposes to require that if piston travel is found to be less than 7 inches or more than 9 inches, it must be adjusted to nominally 7½ inches, which is a change from the 7 inches as currently required, in order to maintain consistency with the requirement proposed at § 232.205(b)(5). This change is based on a request by AAR to change the adjustment to 7½ inches from 7 inches as its member railroads were finding it extremely difficult to adjust the piston travel to precisely 7 inches and that in some cases the adjustment would be marginally less than 7 inches, thus requiring a readjustment. Therefore, AAR sought the extra ½ inch in order to provide a small measure for error when the piston travel is adjusted. As FRA believes that AAR's concerns are validly placed and would have no impact on safety, FRA has accommodated the request. Paragraph (d)(2) proposes enhanced safety assurances with respect to the proper functioning of angle cocks by additionally requiring that they be inspected to ensure they are properly positioned to allow maximum air flow. This is a clarification regarding the normal functioning of the angle cock, and should pose little, if any, additional inspection burden on the railroads.

FRA recognizes that circumstances arise where required repair track brake tests or single car tests cannot always be performed at the point where repairs can be made. Therefore, in paragraph (e), FRA proposes to allow a car, after repairs are effectuated, to be moved to the next forward location where the test can be performed. FRA intends to make clear that the inability to perform a repair track brake test or a single car test does not constitute an inability to effectuate the necessary repairs. At the same time, however, FRA recognizes rail labor's contention that some carriers often attempt to circumvent the requirements for performing single car and repair track tests by eliminating repair tracks, by moving cars to expediter tracks for repair, or by simply making the repairs in the field. As a means to curtail these practices, FRA proposes to impose extensive tagging requirements on freight cars which, due to the nature of the defective condition(s) detected, require a repair track brake test or single car test but which are moved from the location where repairs are performed prior to receiving the required test. As an alternative to the tagging requirements, FRA proposes to permit a railroad to utilize an automated tracking system to monitor these cars and ensure they receive the requisite tests as prescribed in § 232.303 provided the automated system is approved by FRA.

In paragraph (f) of this section, FRA proposes that cars be stencilled or marked with the location and date of the last repair track or single car test. Alternatively, FRA intends to permit railroads to utilize an electronic record keeping system to accomplish this tracking requirement, provided such a system is approved by FRA. FRA believes these requirements are necessary to ensure the timely performance of these important tests. Without such information, there would be virtually no way for FRA to verify a railroad's compliance with the proposed repair track and single car test requirements.

Section 232.305 Repair Track Brake Tests

This section contains the proposed requirements related to the performance of repair track brake tests. Paragraph (a) of this section proposes to require that repair track brake tests be performed in accordance with AAR Standard S–486, ''Code of Air Brake System Tests for Freight Equipment,'' Section 3.0, contained in AAR's ''Manual of Standards and Recommended Practices'' as revised in November of 1992. This standard delineates the procedural requirements for performing the repair track brake tests, and is directly incorporated into AAR's Interchange Rule 3, Chart A. Repair track tests are currently performed to these specifications, and FRA sees no reason to alter the requirements at this time.

Paragraphs (b) (1)–(6) require that a railroad perform a repair track brake test on freight cars when: (i) A freight car is removed from a train due to an air brake related defect; (ii) a freight car has its brakes cut-out when removed from a train or when placed on a shop or repair track; (iii) a freight car is on a repair or shop track for any reason and has not received a repair track brake test within the previous 12 month period; (iv) a freight car is found with missing or incomplete repair track brake test information; (v) one or more of the brake reservoir, the control valve mounting gasket, and the pipe bracket stud is removed, repaired, or replaced; or (vi) a freight car is found with a wheel with built-up tread, slid flat, or thermally cracked. The specific conditions identified above are generally based on the discussions and positions presented by representatives of rail labor, rail management, and FRA during task force deliberations that were part of the RSAC process.

Paragraphs (c) and (d) of this section propose to require that each freight car receive a repair track air test no less frequently than every 5 years, and not less than 8 years from the date the car was built or rebuilt. FRA strongly believes that these minimum attention periods are sufficient to ensure the safety of the freight car fleet when considered in conjunction with the increased attention that freight cars receive when these types of tests are performed. FRA is confident that this, together with the implementation of the stringent proposed tagging requirements

detailed above, will prevent many of the perceived abuses of these test requirements cited by some commenters.

Section 232.307 Single Car Tests

This section contains the proposed requirements related to the performance of single car tests on freight and other non-passenger equipment. Paragraph (a) of this section proposes to require that freight single car tests to be performed in accordance with AAR Standard S–486, ''Code of Air Brake System Tests for Freight Equipment,'' Section 4.0, contained in AAR's ''Manual of Standards and Recommended Practices'' as revised in November of 1992. This standard delineates the procedural requirements for performing single car air brake tests, and is directly referenced in AAR's Interchange Rule 3, Chart A. Specifically, paragraphs (b)(1)–(3) of this section incorporates the single car test requirements of Chart A by requiring a railroad to perform a single car test on a freight car whenever the service portion, the emergency portion, or the pipe bracket is removed, repaired, or replaced.

Paragraph (c) specifically requires that a single car test be conducted by a qualified person prior to a new or rebuilt car being placed in or returned to revenue service. FRA believes that it is essential for new and rebuilt cars receive this test prior to being placed in revenue service in order to ensure the proper operation of the brake system on the vehicle. Most railroads already require this attention to be given to new and rebuilt cars; thus, the cost of this requirement is minimal and merely incorporates the best practices currently in place in the industry.

Section 232.309 Repair Track Test and Single Car Test Equipment and Devices

This section contains the proposed requirements for maintaining the equipment and devices used in performing repair track and single car air brake tests. The devices and equipment used to perform these tests are safety-critical items. FRA believes that these devices must be kept accurate and functioning properly in order to ensure that repair track and single car tests are properly performed. The calibration and test requirements proposed in this section are based on past experience with test equipment used in the railroad operating environment. FRA believes that the requirements contained in this section are the minimum necessary to keep the equipment in good working order.

Section 232.311 Process for Changing Maintenance Requirements

This section contains the proposed procedural requirements relating to the ability of outside parties to change the proposed maintenance requirements contained in this subpart. FRA acknowledges, and agrees with concerns raised by the RLEA, which contended that FRA's acceptance of AAR's unilateral change in the maintenance requirements allows the AAR to unilaterally establish regulations without public comment. Labor representatives forwarded similar recommendations, stating that any changes made by the AAR in their recommended maintenance practices should be reviewed and approved by the FRA. Prior actions by the AAR led to excessive extension of COT&S intervals without compensating action. This resulted in the need for the current repair and single car test program, which initially led to many failures of brake valves during testing. Repetition of this kind of cycle should not be permitted. Accordingly, paragraph (a) of this section proposes to restrict AAR changes to the maintenance standards referenced in this subpart by requiring such proposed changes to be submitted and reviewed in accordance with the requirements outlined in paragraphs (b)–(d) of this section. Specifically, FRA intends to review any proposed change to determine whether the change is ''safety-critical,'' which includes but is not limited to (i) changes to Chart A, (ii) changes to established maintenance intervals, and (iii) changes to UMLER reporting requirements. If the proposed change is deemed ''safety-critical,'' FRA proposes to address the change pursuant to the Special Approval process proposed in § 232.17, which involves the publishing of a **Federal Register** Notice, conducting a Public Hearing if necessary, and acting based on the information developed and submitted in regard to these proceedings. Whereas, if the proposed change is determined by FRA to be ''non safety-critical,'' FRA will permit the change to be implemented immediately. FRA proposes the process contained in this section in order to respond to the concerns raised by AAR and its' member railroads that FRA devise some sort of quick approval process in order to permit the industry to make minor modifications to existing standards. Thus, FRA has attempted to propose a process it believes should speed the process for making both safety-critical and nonsafety-critical changes.

Subpart E—End-of-Train Devices

This subpart incorporates the design, performance, and testing requirements relating to end-of-train devices (EOTs) that were issued on January 2, 1997, which became effective for all railroads on July 1, 1997, except for those for which the effective date was extended to December 1, 1997 by notice issued on June 4, 1997. *See* 62 FR 278 and 62 FR 30461. This subpart also incorporates the recent modifications made to the two-way EOT requirements to clarify the applicability of the requirements to certain passenger train operations where multiple units of freight-type equipment, material handling cars, or express cars are part of a passenger train's consist. *See* 63 FR 24130.

As noted in the discussion of the applicability provisions contained in § 232.3 of this proposal, this subpart applies to all trains unless specifically excepted by the provisions contained in this subpart. As the provisions contained in this subpart were just recently issued, there is little need to discuss these requirements in detail as they were fully discussed in the publications noted above. However, since their issuance, FRA has discovered that a few of the provisions are in need of minor modification for clarification purposes and to address some valid concerns that have been raised both internally by FRA inspectors and by outside parties. Consequently, in this discussion FRA intends to address only the specific modifications that are being made to the currently effective requirements.

Section 232.405(d) contains a proposed modification of the requirement relating to the diameter of the valve opening and hose on two-way EOTs, which is currently contained in § 232.21(d). The current regulation requires that the valve opening and hose have a minimum diameter of ¾ inch to effect an emergency application. FRA has discovered that sometime prior to the issuance of the final rule on two-way EOTs, Pulse Electronics began manufacturing their two-way EOT with the internal diameter of the hose being ⅝ inch. Testing of the devices manufactured with these smaller diameter hoses showed that they met all criteria for emergency application capability based on standards and guidelines set forth by the AAR. Furthermore, testing of the devices at the Westinghouse facility in Wilmerding, Pennsylvania, demonstrated that the ⅝ inch diameter hose permitted 14 consecutive 50 foot cars with cut-out control valves or 750 feet of brake pipe to be jumped. This is

more than double the AAR standard for control valve requirements. Consequently, FRA proposes to modify § 232.405(d) to permit the use of a 5/8 inch internal diameter hose in the design of the devices.

Based on concerns raised by FRA inspectors and after consideration of the data related to the braking ability of locomotives. FRA proposes to modify the exception currently contained in § 232.23(e)(1) which grants an exception from the two-way EOT requirements to trains operating with a locomotive capable of effectuating an emergency application, located in the rear third of the train. In § 232.407(e)(1), FRA proposes to modify this exception so that it is only applicable to trains operating with a locomotive on the rear of the train. Data supplied by VOLPE demonstrates that stopping distances are greatly increased, and could potentially result in a runaway train or derailment depending on the length of the train, if an obstruction of the brake pipe were to occur directly behind a locomotive located in the rear third of the train. Therefore, FRA proposes that trains with a locomotive located in the rear third of the train no longer be excepted from the two-way EOT requirements, unless the train qualifies for relief under one of the other specific exceptions contained in § 232.407(e). FRA believes that this modification will pose little burden on the railroads since virtually all trains currently operating with a locomotive located in the rear third of the train are equipped with a two-way EOT anyway due to the operational benefits gained from the devices as well as its usefulness in conducting required brake inspection en route.

Based on the above discussion, FRA also proposes to modify the requirements for operating a train that experiences an en route failure of the two-way EOT over a section of track with an average grade of two percent or greater over a distance of two continuous miles. FRA proposes to modify the alternative measure currently contained at § 232.23(g)(1)(iii) which permits the operation over such a grade if a radio-controlled locomotive is placed in the rear third of the train consist and under the continuous of the engineer in the head end of the train. In § 232.407(g)(1)(iii), FRA proposes to modify this alternative measure to permit such operation only if the radio-controlled locomotive is placed at the rear of the train consist. This modification is proposed in order that the alternative methods of operation over a heavy grade remains consistent with the exception from the two-way EOT requirements contained in § 232.407(e) as discussed in the preceding paragraph.

In § 232.407(f)(3), FRA proposes to require that if a train is required to use a two-way EOT, the device shall be activated to effectuate an emergency brake application either by using the manual toggle switch or through automatic activation, whenever it becomes necessary for the locomotive engineer to place the train air brakes in emergency using either the automatic brake valve or the conductor's emergency brake valve or whenever an undesired emergency application of the train air brakes occurs. On June 1, 1998, FRA issued Safety Advisory 98–2 which recommended that railroads adopt the procedure being proposed in this paragraph. *See* 63 FR 30808. FRA issued Safety Advisory 98–2 in response to several recent freight train incidents potentially involving the improper use of a train's air brakes which caused FRA to focus on railroad air brake and train handling procedures related to the initiation of an emergency air brake application, particularly as they pertain to the activation of the two-way EOT from the locomotive. Based on FRA's review of the incidents noted below, and its awareness of other incidents involving non-use of two-way EOTs under similar circumstances, FRA believes that the guidance contained in Safety Advisory 98–2 must be incorporated into the regulations to ensure that the safety benefits of two-way EOTs are fully realized.

FRA and the National Transportation Safety Board (NTSB) are currently investigating four incidents in which a train was placed into emergency braking by use of the normal emergency brake valve handles on the locomotive, and although the train in each instance was equipped with an armed and operable two-way EOT, the device was not activated by the locomotive engineer. These incidents include:

- A March 30, 1997 incident occurring near Ridgecrest, North Carolina, involving Norfolk Southern train No. P32, resulting in 42 cars derailed and two crewmembers injured;
- An October 25, 1997 incident occurring in Houston, Texas, involving Union Pacific train Nos. IHOLB–25 and MTUHO–21, resulting in five locomotives derailed and totally destroyed, and two crewmembers injured;
- A November 3, 1997 incident occurring near Alvord, Texas, involving Burlington Northern Santa Fe train Nos. HALTBAR 1–03 and ESLPCAM 3–11, resulting in three locomotives and seven cars derailed, and two crewmembers injured;
- A March 23, 1998 incident occurring near Herington, Kansas, involving Union Pacific train Nos. MKSTUX–23 and IESLB–21, resulting in one locomotive and 6 cars derailed, and one crewmember injured.

FRA's preliminary findings indicate that in all of the incidents noted above, there was evidence of an obstruction somewhere in the train line, caused by either a closed or partially closed angle cock or a kinked air hose. This obstruction prevented an emergency brake application from being propagated throughout the entire train, front to rear, after such an application was initiated from the locomotive using either the engineer's automatic brake valve handle or the conductor's emergency brake valve. Furthermore, the locomotive engineers in each of the incidents stated that they did not think to use the two-way EOT, when asked why they failed to activate the device.

FRA believes that the operational requirement proposed in this section must be stressed by the railroads when conducting the two-way EOT training proposed in § 232.203. FRA believes that the likelihood of future incidents, such as the ones described above, would be greatly reduced if the proposed train handling procedure is made part of a train crew's training and followed by members of the crew in emergency situations. FRA believes that this additional procedure, together with the proposed training, will not only ensure that an emergency brake application is commenced from both the front and rear of the train in emergency situations, but will familiarize the engineer with the activation and operation of the devices and will educate the engineer to react in the safest possible manner whenever circumstances require the initiation of an emergency brake application.

FRA recognizes that a number of railroads have already adopted procedures similar to that proposed in this section and commends such actions. Although FRA proposes that the device to be activated either manually or automatically, FRA intends to make clear that the front unit of the device is still required to be equipped with a manually operated switch. *See* § 232.405(e). FRA recognizes that some railroads have developed a means in which the rear unit is automatically activated when an engineer makes an emergency application with the brake handle and FRA endorses such innovation. However, FRA believes that an engineer should also be provided a separate, manually operated switch which is independent of any automatic system in order to ensure the activation

of the rear unit in the event that the automatic system fails.

In section 232.409(c), FRA proposes to modify the requirement regarding notification to the locomotive engineer when the device is tested by someone other than a train crew member currently contained at § 232.25(c). Since the rule has been in effect, numerous locomotive engineers have informed FRA that they are not being properly notified when successful completion of the testing and inspection requirements contained in this section are performed by other than train crew members. Many engineers claim that they are not confident that the proper tests and inspections have been conducted on the devices, or that the devices will even operate, when they get verbal confirmation of the test from a dispatcher, especially when the dispatcher does not know who performed the test or when it was performed. Consequently, in order to ensure that the proper tests and inspections are being performed on the devices and to provide locomotive engineers with a measure of confidence that the devices will work as intended, FRA proposes to require that written notification be provided to the engineer when the required tests and inspections are performed by a person other than a train crew member. FRA proposes that the written notification include the date and time of the test, the location where the test was performed, and the name of the person performing the test.

In section 232.409(d), FRA proposes to modify the language related to the annual calibration and testing of EOT devices currently contained at § 232.25(d). The regulation currently states that the devices shall be ''calibrated'' annually. FRA intends to make clear that it intended for railroads' to perform whatever tests or checks are necessary to ensure that the devices are operating within the parameters established by the manufacturers of the devices. Several railroads have attempted to sharp shoot the language currently contained in the regulation, claiming that the manufacturer states that front units do not need to be calibrated on an annual basis, in order to avoid doing any testing of the devices. Although FRA agrees that the front units may not have to be calibrated every year, the devices must be tested in some fashion to verify that they are operating within the manufacturer's specification with regard to radio frequency, signal strength, and modulation and do not require recalibration. FRA has been provided written instructions from the manufacturers' of the devices which contain procedures for testing of both the front and rear units. Furthermore, railroads using the devices in Canada acknowledge that the radio functions of the front and rear units are tested periodically. Consequently, in this paragraph FRA proposes clarifying language in order to avoid any misconceptions as to what actions are required to be performed on these devices on an annual basis.

One issue which has recently arisen, which FRA believes must be addressed, relates to the ability of a railroad to dispatch a train with an inoperative two-way EOT. FRA believes that some clarification is necessary with regard to this issue. The issue has arisen in circumstances where a railroad is aware that a certain location experiences communication problems, and thus, permits trains to depart limiting their speed to 30 mph until communication between the front and rear unit is established. Section 232.23(f)(1) of the current regulations, § 232.407(f)(1) of this proposal, requires that; ''the device shall be armed and operable from the time the train departs from the point where the device is installed until the train reaches its destination.'' Therefore, FRA intends to make clear that a train required to be equipped with a two-way EOT may not be dispatched from a location where a device is installed unless the device is armed and operable. Consequently, railroads may have to install repeater stations at locations where communication problems are prevalent.

Although FRA is not proposing any other specific changes to the requirements incorporated into this subpart, FRA has provided a detailed discussion of several issues that have arisen since the issuance of the final rule on two-way EOTs. This detail discussion is contained in the ''Discussion of Issues and General FRA Conclusions'' portion of this preamble under the heading ''Two-way End-of-Train Devices.'' FRA seeks comment and information from all interested parties related to the issues contained in that discussion in order to potentially take appropriate action at the final rule stage of this proceeding to address those issues.

Subpart F—Introduction of New Brake System Technology

This proposed subpart contains the tests and procedures required to introduce new train brake system technology into revenue service. Several parties commented that the technology necessary for the introduction of advanced braking systems is quickly developing. These new technologies include various forms of electronic braking systems, a variety of braking sensors, and computer-controlled braking systems. In order to allow for and encourage the development of new technology, FRA proposes guidelines regarding the tests and procedures required for introducing new brake system technology. These proposed guidelines require the submission to FRA of a pre-revenue service acceptance testing plan.

FRA intends to make clear that this proposed subpart would only be applicable to new train brake system technology that comply with the statutory mandates contained in 49 U.S.C. 20102, 20301–20304, 20701–20703, 21302, and 21304, but which are not specifically covered by these proposed regulations. Any type of new train brake system which requires an exemption from the Federal railroad safety laws in order to be operated in revenue service cannot be introduced into service pursuant to this section. In order to grant a waiver of the Federal railroad safety laws, FRA is limited by the specific statutory provisions contained in 49 U.S.C. 20306 as well as any FRA procedural requirements contained in this chapter.

Section 232.503 Process To Introduce New Brake System Technology

This section contains the proposed procedural requirements which must be met when a railroad intends to introduce new brake system technology into its system. This section makes clear that the approval of FRA's Associate Administrator for Safety must be obtained by a railroad prior to the railroad's implementation of a pre-revenue service acceptance test plan and before introduction of new brake system technology into revenue service. This section requires that such approval be obtained pursuant to the Special Approval process proposed in § 232.17. Several railroads and manufacturers contended, both in response to the 1994 NPRM and at the RSAC Working Group meetings, that FRA needed to devise some sort of quick approval process in order to permit the industry to rapidly introduce new brake system technologies into revenue service. Thus, FRA has attempted to propose an approval process it believes should speed the process for taking advantage of new technologies over that which is currently available under the waiver process. However, in order to provide an opportunity for all interested parties to provide input for use by FRA in its decision making process, as required by the Administrative Procedure Act, FRA believes that any special approval

provision must, at a minimum, provide proper notice to the public of any significant change or action being considered by the agency with regard to existing regulations.

Section 232.505 Pre-revenue Service Acceptance Testing Plan

This section provides the proposed requirements for pre-revenue service testing of new brake system technology. These tests are extremely important in that they intended to prove that the new brake system can be operated safely in its intended environment. For equipment that has not previously been used in revenue service in the United States, paragraph (a) requires the operating railroad to develop a pre-revenue service acceptance testing plan and obtain FRA approval of the plan under the procedures stated in § 238.17 before beginning testing. Previous testing of the equipment at the Transportation Test Center, on another railroad, or elsewhere will be considered by FRA in approving the test plan. Paragraph (b) requires the railroad to fully execute the tests required by the plan, to correct any safety deficiencies identified by FRA, and to obtain FRA's approval to place the equipment in revenue service prior to introducing the equipment in revenue service. Paragraph (c) requires the railroad to comply with any operational limitations imposed by FRA. Paragraph (d) requires the railroad to make the plan available to FRA for inspection and copying. Paragraph (e) enumerates the elements that must be included in the plan. FRA believes this set of steps and the documentation required by this section are necessary to ensure that all safety risks have been reduced to a level that permits the new brake system technology to be used in revenue service.

In lieu of the requirements of paragraphs (a) through (e), paragraph (f) provides for an abbreviated testing procedure for new brake system technology that has previously been used in revenue service in the United States. The railroad need not submit a test plan to FRA; however, a description of the testing shall be maintained by the railroad and made available to FRA for inspection and copying.

Regulatory Impact

Executive Order 12866 and DOT Regulatory Policies and Procedures

This proposed rule has been evaluated in accordance with existing policies and procedures and is considered to be significant under both Executive Order 12866 and DOT policies and procedures (44 FR 11034, Feb. 26, 1979). FRA has prepared and placed in the docket a regulatory evaluation of the proposed rule. This evaluation estimates the costs and consequences of the proposed rule as well as its anticipated economic and safety benefits. It may be inspected and photocopied during normal business hours by visiting the FRA Docket Clerk at the Office of Chief Counsel, FRA, Seventh Floor, 1120 Vermont Avenue, N.W., in Washington, D.C. Photocopies may also be obtained by submitting a written request by mail to the FRA Docket Clerk at the Office of Chief Counsel, Federal Railroad Administration, 400 Seventh Street, S.W., Washington, D.C. 20590.

The estimated benefits of this proposed rule exceed the estimated costs over a 20-year period at a 7% discount rate. The estimated Net Present Value (NPV) of the total 20-year costs associated with the proposed rule is approximately $98 million; whereas the total 20-year benefits (safety and economic) have been estimated at approximately $106 million. For some freight rail operations the total costs incurred will exceed the benefit savings. For others, the benefit savings will outweigh the costs. The following tables contains the estimated 20-year costs and benefits associated with the proposed rule.

TABLE 3.—ESTIMATED COSTS

Category	NPV costs
Training	$76,929,903
Two-way EOT Training	1,421,731
Retest	4,385,922
Piston Travel Stickers	1,163,062
Air Quality	3,219,072
Dynamic Brake	1,757,621
Cycle Trains	3,972,596
Written Procedures	4,938,929
Total	97,787,837

TABLE 4.—ESTIMATED BENEFITS

Category	NPV benefits
Extended Haul	$66,389,112
Safety Improvements	31,585,909
Two-way EOT Training	5,270,840
Bottom Rod Safety Supports	3,239,650
Total	106,485,510

The estimates contained in the tables above are somewhat preliminary as FRA does not have detailed data relating to the costs of some of the dynamic brake or dry air requirements. FRA seeks comment and additional information from railroads, contractors, and other interested parties regarding choices they may have to make so that a more complete estimate of the costs and benefits of this rule may be made prior to the issuance of the final rule. For purposes of the regulatory impact analysis, FRA has made certain assumptions pertinent to cost elements when it lacked specific data and asks for comments and information on those assumptions from all interested parties.

The estimated benefits are derived primarily through the extended haul provision and a reduction in brake related incidents. FRA has proposed extremely restrictive requirements related to the inspection and movement of trains which will be permitted to travel in excess of 1,000 miles between brake inspections. FRA also anticipates that enhancements to safety will be obtained through the proposed training requirements and through the proposed requirements relating to the retesting of cars failing to apply during a brake inspection. The estimated safety benefits of this proposed rule are derived from the prevention of accidents and the resulting fatalities, injuries, and property damage. FRA has employed an effectiveness rate of 20 percent in an effort to measure the anticipated improvements in safety. Benefits also exist for railroads in terms of reduced train delay, debris removal and repairs which are not estimated. Benefits are also not estimated for the operational benefits which may be derived from permitting the use of a two-way EOT during the performance of a Class I brake test; such as, the time that may be saved when an en route pick-up is made and a Class I brake test is performed. FRA does not currently have an estimate of how many en route pick-ups take place annually.

Regulatory Flexibility Act

The Regulatory Flexibility Act of 1980 (5 U.S.C. 601 *et seq.*) requires an assessment of the impacts of proposed rules on small entities. FRA has conducted a regulatory flexibility assessment of this rule's impact on small entities, and the assessment has been placed in the public docket for this rulemaking.

1. Why Action by the Agency is Being Considered

In 1992, Congress amended the Federal rail safety laws by adding certain statutory mandates related to power brake safety. *See* 49 U.S.C. 20141. These amendments specifically address the revision of the power brake regulations by adding a new subsection which states:

(r) POWER BRAKE SAFETY.—(1) The Secretary shall conduct a review of the Department of Transportation's rules with respect to railroad power brakes, and not later than December 31, 1993, shall revise such rules based on such safety data as may be presented during that review.

(2) In carrying out paragraph (1), the Secretary shall, where applicable, prescribe standards regarding dynamic brake equipment. * * *

Pub. L. No. 102–365, § 7; codified at 49 U.S.C. 20141, superseding 45 U.S.C. 431(r).

In addition to this statutory mandate, FRA received various recommendations and petitions for rulemaking, and determined on its own that the power brake regulations were in need of revision. FRA has been in the process of revising the power brake regulations since 1992. An ANPRM and an NPRM revising the power brake regulations were previously issued on December 31, 1992 and September 16, 1994, respectively. *See* 57 FR 62546 and 59 FR 47676. A detailed discussion of the history leading up to this NPRM is contained in the preamble. The reasons for the actual provisions of the action considered by the agency are explained in the body of the preamble and the section-by-section analysis.

2. The Objectives and Legal Basis for The Rule

The objective of the rule is to enhance the safety of rail transportation, protecting both those people traveling and working on the system, and those people off the system who might be affected by a rail incident by revising the regulations related to the braking systems used and operated in freight and other non-passenger trains to address potential deficiencies in the existing regulations, better address the needs of contemporary railroad operations, and facilitate the use of advanced technologies. The legal basis for this action is reflected in the response to 1. above and in the preamble.

3. A Description of and an Estimate of the Number of Small Entities to Which the Proposed Rule Would Apply

The Small Business Administration (SBA) uses an industry wide definition of ''small entity'' based on employment. Railroads are considered small by SBA definition if they employ fewer than 1,500 people. An agency may establish one or more other definitions of this term, in consultation with the SBA and after an opportunity for public comment, that are appropriate to the agency's activities.

The classification system used in this analysis is that of the FRA. Prior to the SBA regulations establishing size categories, the Interstate Commerce Commission (ICC) developed a classification system for freight railroads as Class I, II, or III, based on annual operating revenue. A Class II railroad has operating revenue greater or equal to $40 million dollars but less than $253.7 million and a Class III railroad has operating revenue below $39 million. The Department of Transportation's Surface Transportation Board, which succeeded the ICC, has not changed these classifications. The ICC classification system has been used pervasively by FRA and the railroad industry to identify entities by size. After consultation with the Office of Advocacy of the SBA and as explained in detail in the ''Interim Policy Statement Concerning Small Entities Subject to the Railroad Safety Laws,'' published August 11, 1997 at 62 Fed. Reg. 43024, FRA has decided to define ''small entity,'' on an interim basis, to include only those entities whose revenues would bring them within the Class III definition. As this is an alternative definition, FRA requests comment from interested parties on its use.

All of the small entities directly affected by this rule are Class III railroads. FRA certifies that this proposed rule is expected to have a significant impact on a substantial number of Class III railroads. FRA did not quantify the estimated annual cost or benefit to the average Class III railroad, annual costs for all non-Class I railroads are shown in Appendix A of the Regulatory Impact Analysis. Class III railroads have about 15 percent of the employees of all Class II and III railroads. As most the costs of this proposed rule on Class III railroads are related to the number and types of employees (training, refresher training, qualification, and internal audit plans) a rough estimate of the costs to Class III railroads is taken as about 15 percent of the training related costs or about $2.1 million discounted at 7 percent over 20 years. It should be noted that this cost figure is a very rough estimate and includes only an estimate of the costs related to training as noted above. Consequently, FRA is seeking comment and information from all interested parties on the costs to these small entities so this estimate can be further refined and developed for the final rule.

4. A Description of the Projected Reporting, Recordkeeping and Other Compliance Requirements of the Proposed Rule, Including an Estimate of the Classes of Small Entities Which Will Be Subject to the Requirements and the Type of Professional Skills Necessary for Preparation of the Report or Record

See the Paperwork Reduction Act analysis.

5. Federal Rules Which May Duplicate, Overlap, or Conflict With the Rule

None.

Significant Alternatives

1. Differing compliance or reporting requirements or timetables which take into account the resources available to small entities:

2. Clarification, consolidation, or simplification of compliance and reporting requirements under the rule for such small entities:

3. Exemption from coverage of the rule, or any part thereof, for such small entities:

FRA considered the role that shortline railroads (Class II and III railroads) have in today's freight industry. FRA believes that the current marketplace requires Class I railroads and shortline railroads to operate as an integrated system. Many of today's shortlines rely on Class I railroads for the training of their employees and the maintenance of their equipment. In addition, many shortline railroads and Class I railroads interchange and operate each others equipment. Therefore, except in limited circumstances, it is impossible, from a regulatory standpoint, to separate shortline railroads from Class I railroads. Therefore, in order to ensure the safety and quality of train and locomotive power braking systems throughout the entire freight industry, this proposal generally imposes a consistent set of requirements on shortline and Class I railroads as a group. Although FRA recognizes that many of the operational benefits created by this proposal are not available to most shortline operations, FRA feels that the integrated nature of the freight industry requires that universally consistent requirements be imposed on both shortline and Class I railroads.

Where possible, efforts were taken in this proposal to minimize the impact on shortline railroads. The proposed requirements related to dynamic brakes provide shortline railroads with the option of declaring the dynamic brake portion of a locomotive disabled, so that they will not needlessly incur the cost of maintaining equipment that they do not choose to employ. FRA also

proposes to permit railroads to perform Class II brake tests on cars added to a train received in interchange, if the train will travel a distance not to exceed 20 miles from the point at which it was received in interchange. The current regulations require the performance of at least a transfer train brake test on the entire train, rather than testing only those cars added. FRA believes this will provide a cost savings to short line railroads and seeks comment from interested parties on the number of transfer train brake tests and initial terminal brake tests that are conducted when trains are received in interchange. FRA also seeks comments and suggestions from all interested parties with regard to any requirement proposed as to alternative approaches that might reduce the impact of the proposal on shortlines, particularly Class III railroads.

4. Use of Performance, Rather Than Design Standards

Where possible, especially with regard to advanced technologies and certain brake system components, an attempt was made to tie the proposed requirements to performance.

Paperwork Reduction Act

The information collection requirements in this proposed rule have been submitted for approval to the Office of Management and Budget (OMB) under the Paperwork Reduction Act of 1995, 44 U.S.C. 3501 *et seq.* The sections that contain the new information collection requirements and the estimated time to fulfill each requirement are as follows:

49 CFR section	Respondent universe	Total annual responses	Average time per response	Total annual burden hours	Total annual burden cost
229.27—Annual tests	20,000 locomotives	18,000 tests	15 minutes	4,500 hours	$157,500
232.7—Waivers	545 railroads	10 petitions	40 hours	400 hours	18,000
232.15—Movement of Defective Equipment:					
Tags	1,220,000 cars	48,200 tags	5 minutes	4,017 hours	140,595
Written Notification	1,220,000 cars	16,000 notices	3 minutes	800 hours	28,000
232.17—Special Approval Procedure:					
Petitions for special approval of safety-critical revision.	545 railroads	1 petition	100 hours	100 hours	4,500
Petitions for special approval of pre-revenue service acceptance plan.	545 railroads	2 petitions	100 hours	200 hours	9,000
Service of petitions	545 railroads	3 petitions	40 hours	120 hours	5,400
Statement of interest	Public/railroads	15 comments	4 hours	60 hours	2,700
CommentPublic/railroads	15 comments	4 hours	60 hours	2,700.	
232.103—Gen'l requirements—all train brake systems.	1,200,000 cars	140,000 stickers	10 minutes	23,333 hours	816,655
Locomotives—1st Year	545 railroads	50 procedures	4 hours	200 hours	9,000
Locomotives—Subquent Years.	25 new railroads	1 procedure	4 hours	4 hours	180
232.105—Gen'l requirements for locomotives.	545 railroads	20,000 inspections	5 minutes	1,667 hours	58,345
232.107—Air source requirements—1st Year.	545 railroads	50 plans	40 hours	2,000 hours	90,000
Subsequent Years	25 new railroads	1 plan	40 hours	40 hours	1,800
Amendments to Plan	50 existing plans	10 amendments	20 hours	200 hours	9,000
Recordkeeping	50 existing plans	2,000 records	20 hours	40,000 hours	1,800,000
Cold weather situations	545 railroads	37 plans	20 hours	740 hours	33,300
232.109—Dynamic brake requirements—status.	545 railroads	1,656,000	5 minutes	138,000 hours	4,830,000
Inoperative dynamic brakes.	8,000 locomotives	records	4 minutes	27 hours	945
Permanently disabled dynamic brakes—1st Year.	8,000 locomotives	400 tags	5 minutes	233 hours	8,155
Subsequent Years	8,000 locomotives	2,800 stencilings	5 minutes	2 hours	70
Operating rules—1st Year	545 railroads	20 stencilings	4 hours	1,200 hours	54,000
Subsequent Years	5 new railroads	300 oper. rules	4 hours	20 hours	900
Amendments	545 railroads	5 operating rules	1 hour	15 hours	675
Knowledge criteria—locomotive engineers—1st Year.	545 railroads	15 amendments	16 hours	4,800 hours	216,000
	5 new railroads	300 amendments	16 hours	80 hours	3,600
232.111—Train information handling—1st Year.	545 railroads	545 procedures	50 hours	27,250 hours	1,226,250
Subsequent Years	10 new railroads	10 procedures	40 hours	400 hours	18,000
Amendments	100 railroads	100 amendments	20 hours	2,000 hours	90,000
Report requirements to train crew.	545 railroads	2,112,000 reports	10 minutes	352,000 hours	12,320,000
232.203—Training requirements—Tr. Prog.—1st Year.	545 railroads	300 programs	80 hours	24,000 hours	1,080,000
Subsequent Years	15 railroads	1 program	100 hours	100 hours	4,500
Amendments to written program.	545 railroads	545 amendments	8 hours	4,360 hours	196,200

49 CFR section	Respondent universe	Total annual responses	Average time per response	Total annual burden hours	Total annual burden cost
Training records	545 railroads	67,000 records	10 minutes	11,167 hours	390,845
Training modifications	545 railroads	67,000 notific.	3 minutes	3,350 hours	117,250
Audit program	545 railroads	545 programs	40 hours	21,800 hours	981,000
Amendments to audit program.	545 railroads	50 amendments	20 hours	1,000 hours	45,000
232.205—Class 1 brake test	545 railroads	1,656,000 notices	45 seconds	20,700 hours	724,500
232.207—Class 1A brake tests—1st Year.	545 railroads	15 lists	30 minutes	8 hours	360
Subsequent Years	545 railroads	1 list	1 hour	1 hour	45
Notification	545 railroads	5 amendments	1 hour	5 hours	225
232.209—Class II brake tests-intermediate inspection.	545 railroads	1,920,000 comnts	3 seconds	1,600 hours	56,000
Operator of train	545 railroads	comnts	2 seconds	1,067 hours	37,345
Electronic communication link.	545 railroads	1,920,000 comm 32,000 messages	2 seconds	18 hours	630
232.211—Class II brake test-trainline continuity insp.	545 railroads	500,000	5 seconds	694 hours	24,290
Electronic communication link.	545 railroads	commun 5,000 messages	5 seconds	7 hours	245
232.213—Extended haul trains	84,000 long dist. mvmts	70 letters	15 minutes	18 hours	810
Record of all defective/inoperative brakes.	84,000 long dist. mvmts	25,200 records	30 minutes	12,600 hours	441,000
232.303—Gen'l requirements—single car test.	1,200,000 frgt. cars	24,000 tags	10 minutes	4,000 hours	140,000
Last repair track brake test/single car test.	1,200,000 frgt. cars	240,000 stncl	5 minutes	20,000 hours	700,000
232.309—Repair track brake test	640 shops	960 tests	30 minutes	480 hours	16,800
232.311—Process for changing maintenance reqmnts.	Assoc. Am. Railroads	1 revision	100 hours	100 hours	4,500
232.403—Design stds—1-way end-of-train (EOTs) dev.	545 railroads	4 billion mess	1/186,000 sec.	6 hours	0
Unique Code	545 railroads	12 requests	5 minutes	1 hour	35
232.405—Design + Performance stds.—2-way EOTs.	545 railroads	8 billion mess	1/186,000 sec.	12 hours	0
232.407—Operations requiring 2-way EOTs.	545 railroads	50,000 comm	30 seconds	417 hours	14,595
232.409—Insp. and Testing of EOTs.	245 railroads	450,000 comm.	30 seconds	3,750 hours	168,750
Telemetry Equipment—Testing and Calibration.	245 railroads	32,708 units	1 minute	545 hours	24,525
232.503—Process to introduce new brake technology.	545 railroads	1 letter	1 hour	1 hour	45
Special approval	545 railroads	1 request	2 hours	2 hours	90
232.505—Pre-revenue service accept. test plan—1st Yr..	545 railroads	1 main	160 hours	160 hours	7,200
Subsequent Years	545 railroads	1 main procedure	160 hours	160 hours	7,200
Amendments	545 railroads	1 main procedure	40 hours	40 hours	1,800
Design description	545 railroads	1 petition	40 hours	40 hours	1,800
Report to FRA Assoc. Admin. for Safety.	545 railroads	1 report	8 hours	8 hours	360 hours
Brake system technology testing.	545 railroads	5 descriptions	40 hours	200 hours	9,000

All estimates include the time for reviewing instructions; searching existing data sources; gathering or maintaining the needed data; and reviewing the information. Pursuant to 44 U.S.C. 3506(c)(2)(B), FRA solicits comments concerning: whether these information collection requirements are necessary for the proper performance of the function of FRA, including whether the information has practical utility; the accuracy of FRA's estimates of the burden of the information collection requirements; the quality, utility, and clarity of the information to be collected; and whether the burden of collection of information on those who are to respond, including through the use of automated collection techniques or other forms of information technology, may be minimized. For information or a copy of the paperwork package submitted to OMB, contact Robert Brogan at 202–493–6292.

Organizations and individuals desiring to submit comments on the collection of information requirements should direct them to Robert Brogan, Federal Railroad Administration, RRS–21, Mail Stop 25, 400 7th Street, S.W., Washington. D.C. 20590. An advance copy of the information collection package for this proposed rule has been forwarded to the Office of Management and Budget for review and approval.

OMB is required to make a decision concerning the collection of information requirements contained in this proposed rule between 30 and 60 days after publication of this document in the **Federal Register**. Therefore, a comment to OMB is best assured of having its full effect if OMB receives it within 30 days of publication. The final rule will respond to any OMB or public

comments on the information collection requirements contained in this proposal.

FRA is not authorized to impose a penalty on persons for violating information collection requirements which do not display a current OMB control number, if required. FRA intends to obtain current OMB control numbers for any new information collection requirements resulting from this rulemaking action prior to the effective date of a final rule. The valid OMB control number for this information collection is 2130–0008.

Environmental Impact

FRA has evaluated these proposed regulations in accordance with its procedures for ensuring full consideration of the environmental impact of FRA actions, as required by the National Environmental Policy Act (42 U.S.C. 4321 *et seq.*), and related directives. This notice meets the criteria that establish this as a non-major action for environmental purposes.

Federalism Implications

This proposed rule has been analyzed in accordance with the principles and criteria contained in Executive Order 12612, and it has been determined that the proposed rule does not have sufficient federalism implications to warrant the preparation of a Federalism Assessment.

Request for Public Comments

FRA proposes to adopt a new part 232 and amend parts 229 and 231 of title 49, Code of Federal Regulations, as set forth below. FRA solicits comments on all aspects of the proposed rules whether through written submissions, or participation in the public hearings, or both. FRA may make changes in the final rules based on comments received in response to this notice.

List of Subjects

49 CFR Part 229

Penalties, Railroad safety, Reporting and recordkeeping requirements.

49 CFR Part 231

Penalties, Railroad safety.

49 CFR Part 232

Penalties, Railroad safety.

The Proposal

In consideration of the following, FRA proposes to amend chapter II, subtitle B of title 49, Code of Federal Regulations as follows:

PART 229—[AMENDED]

1. The authority citation for part 229 is revised to read as follows:

Authority: 49 U.S.C. 20102–20103, 20133, 20137–20138, 20143, 20701–20703, 21301–21302, 21304; 49 CFR 1.49(c), (m).

2. Section 229.5 is amended by adding a new paragraph (p) to read as follows:

§ 229.5 Definitions.

* * * * *

(p) *Electronic air brake* means a computer based system which provides the means for control of the locomotive brakes or train brakes or both.

3. Section 229.25 is amended by revising paragraph (a) to read as follows:

§ 229.25 Tests: Every periodic inspection.

* * * * *

(a) All mechanical gauges used by the engineer for braking the train or locomotive, except load meters used in conjunction with an auxiliary brake system, shall be tested by comparison with a dead-weight tester or a test gauge designed for this purpose.

* * * * *

4. Section 229.27 is amended by redesignating paragraphs (a)(3) and (a)(4) as paragraphs (a)(4) and (a)(5), by adding a new paragraph (a)(3), and by revising paragraph (b) to read as follows:

§ 229.27 Annual tests.

* * * * *

(a) * * *

(3) The compressor or compressors shall be tested for capacity by orifice test.

* * * * *

(b) The load meter shall be tested. Each device used by the engineer for braking the train or locomotive that provides an indication of air pressure electronically shall be tested by comparison with a test gauge or self-test designed for this purpose. Errors of greater than five percent or three pounds per square inch, whichever is less, shall be corrected. The date and place of the test shall be recorded on Form FRA F 6180–49A, and the person conducting the test and that person's supervisor shall sign the form.

* * * * *

5. Section 229.53 is revised to read as follows:

§ 229.53 Brake gauges.

All mechanical gauges and all devices providing indication of air pressure electronically that are used by the engineer for braking the train or locomotive shall be located so that they may be conveniently read from the engineer's usual position during operation. A gauge or device shall not be more than three pounds per square inch in error.

PART 231—[AMENDED]

6. The authority citation for part 231 is revised to read as follows:

Authority: 49 U.S.C. 20102–20103, 20131, 20301–20303, 21301–21302, 21304; 49 CFR 1.49(c), (m).

7. Section 231.0 is amended by adding paragraphs (b)(3) through (5) and paragraph (f) to read as follows:

§ 231.0 Applicability and penalties.

* * * * *

(b) * * *

(3) A freight train of four-wheel coal cars.

(4) A freight train of eight-wheel standard logging cars if the height of each car from the top of the rail to the center of the coupling is not more than 25 inches.

(5) A locomotive used in hauling a train referred to in paragraph (b)(4) of this section when the locomotive and cars of the train are used only to transport logs.

* * * * *

(f) Except as provided in paragraph (b) of this section, § 231.31 also applies to an operation on a 24-inch, 36-inch, or other narrow gage railroad.

8. Part 231 is further amended by adding § 231.31 to read as follows:

§ 231.31 Drawbars for freight cars; standard height.

(a) Except on cars specified in paragraph (b) of this section—

(1) On standard gage (56½-inch gage) railroads, the maximum height of drawbars for freight cars (measured perpendicularly from the level of the tops of the rails to the centers of the drawbars) shall be 34½ inches, and the minimum height of drawbars for freight cars on such standard gage railroads (measured in the same manner) shall be 31½ inches.

(2) On 36-inch gage railroads, the maximum height of drawbars for freight cars (measured from the level of the tops of rails to the centers of the drawbars) shall be 26 inches, and the minimum height of drawbars for freight cars on such 36-inch gage railroads (measured in the same manner) shall be 23 inches.

(3) On 24-inch gage railroads, the maximum height of drawbars for freight cars (measured from the level of the tops of rails to the centers of drawbars) shall be 17½ inches, and the minimum height of drawbars for freight cars on 24-inch gage railroads (measured in the same manner) shall be 14½ inches.

(4) On railroads operating on track with a gage other than those contained in paragraphs (a)(1) through (a)(3), the maximum and minimum height of drawbars for freight cars operating on

those railroads shall be established upon written approval of FRA.

(b) This section shall not apply to a railroad all of whose track is less than 24 inches in gage.

9. Appendix A of Part 231 is amended by adding an entry for § 231.31 to the end of the Schedule of Civil Penalties to read as follows:

APPENDIX A TO PART 231—SCHEDULE OF CIVIL PENALTIES

	FRA safety appliance defect code section	Violation	Willful violation
*	* *	*	*
231.31	Drawbars, standard height.	2,500	5,000
*	* *	*	*

10. Part 232 is revised to read as follows:

PART 232—BRAKE SYSTEM SAFETY STANDARDS FOR FREIGHT AND OTHER NON-PASSENGER TRAINS AND EQUIPMENT

Subpart A—General

Sec.
232.1 Purpose and scope.
232.3 Applicability.
232.5 Definitions.
232.7 Waivers.
232.9 Responsibility for compliance.
232.11 Penalties.
232.13 Preemptive effect.
232.15 Movement defective equipment.
232.17 Special approval procedure.

Subpart B—General Requirements

232.101 Scope.
232.103 General requirements for all train brake systems.
232.105 General requirements for locomotives.
232.107 Air source requirements and cold weather operations.
232.109 Dynamic brake requirements.
232.111 Train handling information.

Subpart C—Inspection and Testing Requirements

232.201 Scope.
232.203 Training requirements.
232.205 Class I brake tests—Initial terminal inspection.
232.207 Class IA brake tests—1,000-mile inspection.
232.209 Class II brake tests—Intermediate inspection.
232.211 Class III brake tests—Trainline continuity inspection.
232.213 Extended haul trains.
232.215 Transfer train brake test.
232.217 Train brake system tests conducted using yard air.
232.219 Double heading, helper service, and distributed power.

Subpart D—Periodic Maintenance and Testing Requirements

232.301 Scope.
232.303 General requirements.
232.305 Repair track brake tests.
232.307 Single car tests.
232.309 Repair track brake test and single car test equipment and devices.
232.311 Process for changing maintenance requirements.

Subpart E—End-of-Train Devices

232.401 Scope.
232.403 Design standards for one-way end-of-train devices.
232.405 Design and performance standards for two-way end-of-train devices.
232.407 Operations requiring use of two-way end-of-train devices; prohibition on purchase of nonconforming devices.
232.409 Inspection and testing of end-of-train devices.

Subpart F—Introduction of New Brake System Technology

232.501 Scope.
232.503 Process to introduce new brake system technology.
232.505 Pre-revenue service acceptance testing plan.

Appendix A—Schedule of Civil Penalties [Reserved]

Authority: 49 U.S.C. 20102–20103, 20133, 20141, 20301–20303, 20306, 21301–21302, 21304; 49 CFR 1.49 (c), (m).

Subpart A—General

§ 232.1 Purpose and scope.

This part prescribes the minimum Federal safety standards for all freight and other non-passenger train brake systems and equipment. This part does not restrict a railroad from adopting or enforcing additional or more stringent requirements not inconsistent with this part.

§ 232.3 Applicability.

(a) Except as provided in paragraphs (b) and (c) of this section, this part applies to all railroads that operate freight or other non-passenger train service on standard gage track which is part of the general railroad system of transportation.

(b) Subpart E of this part applies to all trains operating on track which is part of the general railroad system of transportation unless specifically excepted in that subpart.

(c) Except as provided in paragraph (b) of this section, this part does not apply to:

(1) A railroad that operates only on track inside an installation that is not part of the general railroad system of transportation.

(2) Intercity or commuter passenger train operations on standard gage track which is part of the general railroad system of transportation;

(3) Commuter or other short-haul rail passenger train operations in a metropolitan or suburban area (as described by 49 U.S.C. 20102(1)), including public authorities operating passenger train service;

(4) Rapid transit operations in an urban area that are not connected with the general railroad system of transportation;

(5) Tourist, scenic, historic, or excursion operations, whether on or off the general railroad system;

(6) A freight train of four-wheel coal cars;

(7) A freight train of eight-wheel standard logging cars if the height of each car from the top of the rail to the center of the coupling is not more than 25 inches; or

(8) A locomotive used in hauling a train referred to in paragraph (b)(6) of this section when the locomotive and cars of the train are used only to transport logs.

(d) The provisions formerly contained in Interstate Commerce Commission Order 13528, of May 30, 1945, as amended, now revoked, are codified in this paragraph. This part is not applicable to the following equipment:

(1) Scale test weight cars;

(2) Locomotive cranes, steam shovels, pile drivers, and machines of similar construction, and maintenance machines built prior to September 21, 1945;

(3) Export, industrial, and other cars not owned by a railroad which are not to be used in service, except for movement as shipments on their own wheels to given destinations. Such cars shall be properly identified by a card attached to each side of the car, signed by the shipper, stating that such movement is being made under the authority of this paragraph.

(4) Industrial and other than railroad-owned cars which are not to be used in service except for movement within the limits of a single switching district (i.e., within the limits of an industrial facility);

(5) Narrow-gage cars; and

(6) Cars used exclusively in switching operations and not used in train movements within the meaning of the Federal safety appliance laws (49 U.S.C. 20301–20306).

§ 232.5 Definitions.

For purposes of this part—

AAR means the Association of American Railroads.

Air brake means a combination of devices operated by compressed air, arranged in a system, and controlled manually, electrically, electronically, or pneumatically, by means of which the

motion of a railroad car or locomotive is retarded or arrested.

Air Flow Indicator, AFM means a specific air flow indicator required by the air flow method of qualifying train air brakes (AFM). The AFM Air Flow Indicator is a calibrated air flow measuring device which is clearly visible and legible in daylight and darkness from the engineer's normal operating position. The indicator face displays

(1) Markings from 10 cubic feet per minute (CFM) to 80 CFM, in increments of 10 CFM or less, and

(2) Numerals indicating 20, 40, 60, and 80 CFM for continuous monitoring of air flow.

Bind means restrict the intended movement of one or more brake system components by reduced clearance, by obstruction, or by increased friction.

Brake, dynamic means a train braking system whereby the kinetic energy of a moving train is used to generate electric current at the locomotive traction motors, which is then dissipated through resistor grids or into the catenary or third rail system.

Brake, effective means a brake that is capable of producing its required designed retarding force on the train. A car's air brake is not considered effective if its piston travel exceeds:

(1) 10½ inches for cars equipped with nominal 12-inch stroke brake cylinders; or

(2) The piston travel limits indicated on the stencil, sticker, or badge plate for that brake cylinder.

Brake, hand means a brake that can be applied and released by hand to prevent or retard the movement of a locomotive.

Brake indicator means a device which indicates the brake application range and indicates whether brakes are applied and released.

Brake, inoperative means a primary brake that, for any reason, no longer applies or releases as intended.

Brake, parking means a brake that can be applied by means other than by hand, such as spring, hydraulic, or air pressure when the brake pipe air is depleted, or by an electrical motor.

Brake pipe means the system of piping (including branch pipes, angle cocks, cutout cocks, dirt collectors, hoses, and hose couplings) used for connecting locomotives and all railroad cars for the passage of compressed air.

Brake, primary means those components of the train brake system necessary to stop the train within the signal spacing distance without thermal damage to friction braking surfaces.

Brake, secondary means those components of the train brake system which develop supplemental brake retarding force that is not needed to stop the train within signal spacing distances or to prevent thermal damage to wheels.

Emergency application means an irretrievable brake application resulting in the maximum retarding force available from the train brake system.

End-of-train device, one-way means two pieces of equipment linked by radio that meet the requirements of § 232.403.

End-of-train device, two-way means two pieces of equipment linked by radio that meet the requirements of §§ 232.403 and 232.405.

Foul means any condition which restricts the intended movement of one or more brake system components because the component is snagged, entangled, or twisted.

Freight car means a vehicle designed to carry freight, or railroad personnel, by rail and a car designed for use in a work or wreck train or other non-passenger train.

Locomotive means a piece of railroad on-track equipment, other than hi-rail, specialized maintenance, or other similar equipment, which may consist of one or more units operated from a single control stand—

(1) With one or more propelling motors designed for moving other railroad equipment;

(2) With one or more propelling motors designed to transport freight or passenger traffic or both; or

(3) Without propelling motors but with one or more control stands.

Locomotive cab means that portion of the superstructure designed to be occupied by the crew operating the locomotive.

Locomotive, controlling means the locomotive from which the engineer exercises control over the train.

Off air means equipment that is not connected to a continuous source of compressed air of at least 60 pounds per square inch (psi).

Ordered or date ordered means the date on which notice to proceed is given by a procuring railroad to a contractor or supplier for new equipment.

Piston travel means the amount of linear movement of the air brake hollow rod (or equivalent) or piston rod when forced outward by movement of the piston in the brake cylinder or actuator and limited by the brake shoes being forced against the wheel or disc.

Point of origin means the location where a train is originally assembled; it is also referred to as the initial terminal.

Pre-revenue service acceptance testing plan means a document, as further specified in § 232.505, prepared by a railroad that explains in detail how pre-revenue service tests of certain equipment demonstrate that the equipment meets Federal safety standards and the railroad's own safety design requirements.

Previously tested equipment means equipment that has received a Class I brake test pursuant to § 232.205 and has not been off air for more than four hours.

Qualified mechanical inspector means a qualified person who has received, as a part of the training, qualification, and designation program required under § 232.203, instruction and training that includes ''hands-on'' experience (under appropriate supervision or apprenticeship) in one or more of the following functions: troubleshooting, inspection, testing, maintenance or repair of the specific train brake and other components and systems for which the inspector is assigned responsibility. Further, the mechanical inspector shall be a person whose primary responsibility includes work generally consistent with the functions referenced in this definition.

Qualified person means a person determined by a railroad to have the knowledge and skills necessary to perform one or more functions required under this part. The railroad determines the qualifications and competencies for employees designated to perform various functions in the manner set forth in this part.

Railroad means any form of non-highway ground transportation that runs on rails or electromagnetic guideways, including:

(1) Commuter or short-haul rail passenger service in a metropolitan or suburban area and commuter railroad service that was operated by the Consolidated Rail Corporation on January 1, 1979; and

(2) High speed ground transportation systems that connect metropolitan areas, without regard to whether those systems use new technologies not associated with traditional railroads. The term ''railroad'' is also intended to mean a person that provides railroad transportation, whether directly or by contracting out operation of the railroad to another person. The term does not include rapid transit operations in an urban area that are not connected to the general railroad system of transportation.

Rebuilt equipment means equipment that has undergone overhaul identified by the railroad as a capital expense under the Surface Transportation Board's accounting standards.

Refresher training means periodic retraining required for employees or contractors to remain qualified to perform specific equipment

troubleshooting, inspection, testing, maintenance, or repair functions.

Respond as intended means to produce the result that a device or system is designed to produce.

Service application means a brake application that results from one or more service reductions or the equivalent.

Service reduction means a decrease in brake pipe pressure, usually from 5 to 25 psi at a rate sufficiently rapid to move the operating valve to service position, but at a rate not rapid enough to move the operating valve to emergency position.

Solid block of cars means two or more freight cars continuously and consecutively coupled together in a train which, when removed from the train, remain intact and coupled together with the train line remaining connected and open within the block.

State inspector means an inspector of a participating State rail safety program under part 212 of this chapter.

Switching service means the classification of freight cars according to commodity or destination; assembling of cars for train movements; changing the position of cars for purposes of loading, unloading, or weighing; placing of locomotives and cars for repair or storage; or moving of rail equipment in connection with work service that does not constitute a train movement.

Tourist, scenic, historic, or excursion operations are railroad operations that carry passengers, often using antiquated equipment, with the conveyance of the passengers to a particular destination not being the principal purpose.

Train means one or more locomotives coupled with one or more freight cars, except during switching service.

Train line means the brake pipe or any other non-pneumatic system used to transmit the signal that controls the locomotive and freight car brakes.

Transfer train means a train that travels between a point of origin and a point of final destination not exceeding 20 miles and is not performing switching service.

Yard air means a source of compressed air other than from a locomotive.

Yard train means a train used only to perform switching service within a single yard.

§ 232.7 Waivers.

(a) Any person subject to a requirement of this part may petition the Administrator for a waiver of compliance with such requirement. The filing of such a petition does not affect that person's responsibility for compliance with that requirement while the petition is being considered.

(b) Each petition for waiver must be filed in the manner and contain the information required by part 211 of this chapter.

(c) If the Administrator finds that a waiver of compliance is in the public interest and is consistent with railroad safety, the Administrator may grant the waiver subject to any conditions the Administrator deems necessary. Where a waiver is granted, the Administrator publishes a notice in the **Federal Register** containing the reasons for granting the waiver.

§ 232.9 Responsibility for compliance.

(a) A railroad subject to this part shall not use, haul, permit to be used or hauled on its line, offer in interchange, or accept in interchange any train, railroad car, or locomotive with one or more conditions not in compliance with this part; however, a railroad shall not be liable for a civil penalty for such action if such action is in accordance with § 232.15. For purposes of this part, a train, railroad car, or locomotive will be considered in use prior to departure but after it has received, or should have received, the inspection required for movement and is deemed ready for service.

(b) Although many of the requirements of this part are stated in terms of the duties of a railroad, when any person performs any function required by this part, that person (whether or not a railroad) is required to perform that function in accordance with this part.

(c) Any person performing any function or task required by this part will be deemed to have consented to FRA inspection of their operation to the extent necessary to ensure that the function or task is being performed in accordance with the requirements of this part.

§ 232.11 Penalties.

(a) Any person (including but not limited to a railroad; any manager, supervisor, official, or other employee or agent of a railroad; any owner, manufacturer, lessor, or lessee of railroad equipment, track, or facilities; any employee of such owner, manufacturer, lessor, lessee, or independent contractor) who violates any requirement of this part or causes the violation of any such requirement is subject to a civil penalty of at least $500, but not more than $11,000 per violation, except that: Penalties may be assessed against individuals only for willful violations, and, where a grossly negligent violation or a pattern of repeated violations has created an imminent hazard of death or injury to persons, or has caused death or injury, a penalty not to exceed $22,000 per violation may be assessed. Each day a violation continues shall constitute a separate offense. Appendix A contains a schedule of civil penalty amounts used in connection with this part.

(b) Any person who knowingly and willfully falsifies a record or report required by this part may be subject to criminal penalties under 49 U.S.C. 21311.

§ 232.13 Preemptive effect.

(a) Under 49 U.S.C. 20106, issuance of the regulations in this part preempts any State law, rule, regulation, order, or standard covering the same subject matter, except for a provision directed at an essentially local safety hazard if that provision is consistent with this part and does not impose an undue burden on interstate commerce.

(b) FRA does not intend by issuance of the regulations in this part to preempt provisions of State criminal law that impose sanctions for reckless conduct that leads to actual loss of life, injury, or damage to property, whether such provisions apply specifically to railroad employees or generally to the public at large.

§ 232.15 Movement of defective equipment.

(a) *General provision.* Except as provided in paragraph (c) of this section, a railroad car or locomotive with one or more conditions not in compliance with this part may be used or hauled without civil penalty liability under this part only if all of the following conditions are met:

(1) The defective car or locomotive is properly equipped in accordance with the applicable provisions of 49 U.S.C. chapter 203 and the requirements of this part.

(2) The car or locomotive becomes defective while it is being used by the railroad on its line or becomes defective on the line of a connecting railroad and is properly accepted in interchange for repairs in accordance with paragraph (a)(7) of this section.

(3) The railroad first discovers the defective condition of the car or locomotive prior to moving it for repairs.

(4) The movement of the defective car or locomotive for repairs is from the location where the car or locomotive is first discovered defective by the railroad.

(5) The defective car or locomotive could not be repaired at the place where the railroad first discovers it to be defective.

(6) The movement of the car or locomotive is necessary to make repairs to the defective condition.

(7) The repair location to which the car or locomotive is being taken is the nearest available repair location on the line of the railroad where the car or locomotive was first found to be defective or is the nearest available repair location on the line of a connecting railroad if:

(i) The connecting railroad elects to accept the defective car or locomotive for such repair; and

(ii) The nearest available repair location on the line of the connecting railroad is no farther than the nearest available repair location on the line of the railroad where the car or locomotive was found defective.

(8) The movement of the defective car or locomotive for repairs is not by a train required to receive a Class I brake test at that location pursuant to § 232.205.

(9) The movement of the defective car or locomotive for repairs is not in a train in which more than 15 percent of the cars have inoperative brakes.

(10) The defective car or locomotive is tagged, or information is recorded, as prescribed in paragraph (b) of this section.

(11) Except for cars or locomotives with brakes cut out en route, the following additional requirements are met:

(i) A qualified inspector shall determine—

(A) That it is safe to move the car or locomotive; and

(B) The maximum safe speed and other restrictions necessary for safely conducting the movement.

(ii) The person in charge of the train in which the car or locomotive is to be moved shall be notified in writing and inform all other crew members of the presence of the defective car or locomotive and the maximum speed and other restrictions determined under paragraph (a)(11)(i)(B) of this section. A copy of the tag or card described in paragraph (b) of this section may be used to provide the notification required by this paragraph.

(12) The defective car or locomotive is not subject to a Special Notice for Repair under part 216 of this chapter, unless the movement of the defective car is made in accordance with the restrictions contained in the Special Notice.

(b) *Tagging of defective equipment.* (1) At the place where the railroad first discovers the defect, a tag or card shall be placed on both sides of the defective equipment or locomotive and in the cab of the locomotive, or an automated tracking system approved for use by FRA shall be provided with the following information about the defective equipment:

(i) The reporting mark and car or locomotive number;

(ii) The name of the inspecting railroad;

(iii) The name and job title of the inspector;

(iv) The inspection location and date;

(v) The nature of each defect;

(vi) A description of any movement restrictions;

(vii) The destination of the equipment where it will be repaired; and

(viii) The signature, if possible, of the person reporting the defective condition.

(2) The tag or card required by paragraph (b)(1) of this section shall remain affixed to the defective equipment until the necessary repairs have been performed.

(3) A record or copy of each tag or card attached to or removed from a car or locomotive shall be retained for 90 days and, upon request, shall be made available within 15 calendar days for inspection by FRA or State inspectors.

(4) Each tag or card removed from a car or locomotive shall contain the date, location, reason for its removal, and the signature of the person who removed it from the piece of equipment.

(c) *Movement for unloading or purging of defective cars.* If the defective freight car is loaded with a hazardous material or contains residue of a hazardous material, the car may not be placed for unloading or purging unless unloading or purging is consistent with determinations made and restrictions imposed under paragraph (a)(11)(i) of this section and the unloading or purging is necessary for the safe repair of the car.

(d) *Computation of percent operative power brakes.* (1) The percentage of operative power brakes in a train shall be based on the number of control valves in the train. The percentage shall be determined by dividing the number of control valves that are cut-in by the total number of control valves in the train.

(2) The following brake conditions not in compliance with this part are not considered inoperative power brakes for purposes of this section:

(i) Failure or cutting out of secondary brake systems;

(ii) Inoperative or otherwise defective handbrakes or parking brakes;

(iii) Piston travel that is in excess of the Class I brake test limits required in § 232.205 but that does not exceed the outside limits contained on the stencil, sticker, or badge plate required by § 232.103(g) for considering the power brakes to be effective; and

(iv) Power brakes overdue for inspection, testing, maintenance, or stenciling under this part.

(e) *Placement of equipment with inoperative brakes.* (1) A freight car or locomotive with inoperative brakes shall not be placed as the rear car of the train.

(2) No more than two freight cars with inoperative brakes shall be consecutively placed in a train.

(3) Multi-unit articulated equipment shall not be placed in a train if the equipment has consecutive individual control valves cut-out or inoperative.

§ 232.17 Special approval procedure.

(a) *General.* The following procedures govern consideration and action upon requests for special approval of safety-critical revisions to the maintenance standards contained in subpart D of this part and for special approval of pre-revenue service acceptance testing plans under subpart F of this part.

(b) *Petitions for special approval of safety-critical revision.* Each petition for special approval of a safety-critical revision to the periodic maintenance standards contained in subpart D shall contain—

(1) The name, title, address, and telephone number of the primary person to be contacted with regard to review of the petition;

(2) The alternative proposed, in detail, to be substituted for the particular requirements of this part;

(3) Appropriate data or analysis, or both, for FRA to consider in determining whether the alternative will provide an equivalent level of safety; and

(4) A statement affirming that the railroad has served a copy of the petition on designated representatives of its employees, together with a list of the names and addresses of the persons served.

(c) *Petitions for special approval of pre-revenue service acceptance testing plan.* Each petition for special approval of a pre-revenue service acceptance testing plan shall contain—

(1) The name, title, address, and telephone number of the primary person to be contacted with regard to review of the petition; and

(2) The elements prescribed in § 232.505.

(d) *Service.* (1) Each petition for special approval under paragraph (b) or (c) of this section shall be submitted in triplicate to the Associate Administrator for Safety, Federal Railroad Administration, 400 7th Street, S.W., Washington, D.C. 20590.

(2) (i) Service of each petition for special approval of a safety-critical revision to the maintenance standards under paragraph (b) of this section shall be made on the following:

(A) Designated employee representatives responsible for the equipment's operation, inspection, testing, and maintenance under this part;

(B) Any organizations or bodies that either issued the standard incorporated in the section(s) of the rule to which the special approval pertains or issued the alternative standard that is proposed in the petition; and

(C) Any other person who has filed with FRA a current statement of interest in reviewing special approvals under the particular requirement of this part at least 30 days but not more than 5 years prior to the filing of the petition.

(ii) If filed, a statement of interest shall be filed with FRA's Associate Administrator for Safety and shall reference the specific section(s) of this part in which the person has an interest.

(e) Federal Register notice. FRA will publish a notice in the **Federal Register** concerning each petition under paragraph (b) of this section.

(f) *Comment.* Not later than 30 days from the date of publication of the notice in the **Federal Register** concerning a petition under paragraph (b) of this section, any person may comment on the petition.

(1) A comment shall set forth specifically the basis upon which it is made, and contain a concise statement of the interest of the commenter in the proceeding.

(2) The comment shall be submitted in triplicate to the Associate Administrator for Safety, Federal Railroad Administration, 400 7th Street, S.W., Washington, D. C. 20590.

(3) The commenter shall certify that a copy of the comment was served on each petitioner.

(g) *Disposition of petitions.* (1) If FRA finds that the petition complies with the requirements of this section and that the proposed safety-critical revision or pre-revenue service plan is acceptable and justified, the petition will be granted, normally within 90 days of its receipt. If the petition is neither granted nor denied within 90 days, the petition remains pending for decision. FRA may attach special conditions to the approval of any petition. Following the approval of a petition, FRA may reopen consideration of the petition for cause.

(2) If FRA finds that the petition does not comply with the requirements of this section and that the proposed safety-critical revision or pre-revenue service plan is not acceptable or justified, the petition will be denied, normally within 90 days of its receipt.

(3) When FRA grants or denies a petition, or reopens consideration of the petition, written notice is sent to the petitioner and other interested parties.

Subpart B—General Requirements

§ 232.101 Scope.

This subpart contains general operating, performance, and design requirements for each railroad that operates freight or other non-passenger trains and for specific equipment used in those operations.

§ 232.103 General requirements for all train brake systems.

(a) A train's primary brake system shall be capable of stopping the train with a service application from its maximum operating speed within the signal spacing existing on the track over which the train is operating.

(b) If the integrity of the pneumatic communication line of a train brake system is broken, the train shall be stopped. If a train brake communication line uses other than solely pneumatic technology, the integrity of the train line shall be monitored by the brake control system.

(c) A train brake system shall respond as intended to signals from the train line.

(d) A train shall have 100-percent effective and operative brakes prior to departure from its point of origin (initial terminal).

(e) From points other than those described in paragraph (d) of this section, a train shall not move if more than 15 percent of the cars in that train have inoperative or ineffective brakes.

(f) Each car in a train shall have its air brakes in effective operating condition unless the car is being moved for repairs in accordance with § 232.15. A car's air brakes are not in effective operating condition if its brakes are cut-out or otherwise inoperative or if the piston travel exceeds:

(1) 10½ inches for cars equipped with nominal 12-inch stroke brake cylinders; or

(2) The piston travel limits indicated on the stencil, sticker, or badge plate for that brake cylinder.

(g) Except for cars equipped with nominal 12-inch stroke (8½ and 10-inch diameters) brake cylinders, all cars shall have a legible stencil or sticker affixed to the car or shall be equipped with a badge plate displaying the permissible brake cylinder piston travel range for the car at Class I brake tests and the length at which the piston travel renders the brake ineffective. The stencil, sticker, or badge plate shall be located so that it may be easily read and understood by a person positioned safely beside the car.

(h) All equipment ordered on or after January 1, 1999, or placed in service for the first time on or after January 1, 2001, shall have train brake systems designed so that an inspector can observe from a safe position the piston travel, an accurate indicator which shows piston travel, or any other means by which the brake system is actuated. The design shall not require the inspector to place himself/herself on, under, or between components of the equipment to observe brake actuation or release.

(i) All trains shall be equipped with an emergency application feature that produces an irretrievable stop, using a brake rate consistent with prevailing adhesion, train safety, and brake system thermal capacity. An emergency application shall be available at all times, and shall be initiated by an unintentional parting of the train or loss of train brake communication.

(j) The air brake system components that control brake application and release shall be adequately sealed to prevent contamination by foreign material.

(k) A railroad shall set the maximum main reservoir working pressure.

(l) The maximum brake pipe pressure shall not be greater than 15 psi less than the air compressor governor starting or loading pressure.

(m) Except as otherwise provided in this part, all equipment used in freight or other non-passenger trains shall, at a minimum, meet the performance specification for freight brakes in Association of American Railroads standard S–469–47 contained in the AAR ''Manual of Standards and Recommended Practices'' (revised 1947).

(n) If a train qualified by the Air Flow Method as provided for in subpart C of this part experiences a brake pipe air flow of greater than 60 CFM or brake pipe gradient of greater than 15 psi while en route and the movable pointer does not return to those limits within a reasonable time, the train shall be stopped at the next available location and be inspected for leaks in the brake system.

(o) *Securement of standing equipment.* A train's air brake shall not be depended upon to hold equipment standing on a grade (including a locomotive, a car, or a train whether or not locomotive is attached). Trains and other railroad equipment shall be secured in accordance with the following requirements:

(1) Consistent with the railroad's rules and procedures, place each locomotive, car, or train on a track that is protected by a permanent derail or apply a portable derail, if available.

(2) *Freight and other non-powered rail cars.* (i) A sufficient number of hand brakes shall be applied to hold such equipment before the air brakes are released. Railroads shall develop and implement a process or procedure, such as a matrix, that would provide specific guidance in determining the appropriate number of hand brakes to apply, considering grade, tonnage, and other local conditions prevalent at the time of securement;

(ii) Where appropriate, slack shall be removed from the train, or as commonly referred to in the industry, ''bunch the slack''; and

(iii) Locomotives shall be detached from the cars to allow an emergency brake application.

(3) *Locomotives.* (i) All hand brakes shall be fully applied on all unattended locomotives in the consist;

(ii) If the grade on which the locomotives are left standing exceeds one percent, or whenever it is otherwise required by railroad rules, the front and back of at least one pair of wheels in the locomotive consist shall be chocked or chained; and

(iii) Railroads shall adopt and comply with a process or procedures to verify that the available hand brakes will sufficiently hold the locomotive consist. Railroads shall also develop and implement instructions to address throttle position, status of the reverse lever, position of the generator field switch, status of the independent brakes, position of the isolation switch, and position of the automatic brake valve on all locomotives. The procedures in this paragraph shall take into account winter weather conditions as they relate to throttle position and reverser handle.

(4) Any hand brakes applied to hold the equipment shall not be released until it is known that the air brake system is properly charged.

(p) Air pressure regulating devices shall be adjusted for the following pressures:

	PSI
LOCOMOTIVES	
(1) Minimum brake pipe air pressure:	
Road Service	9060
Switch Service	
(2) Minimum differential between brake pipe and main reservoir air pressures, with brake valve in running position	15
(3) Safety valve for straight air brake	30–55
(4) Safety valve for LT, ET, No. 8–EL, No. 14 El, No. 6–DS, No. 6–BL and No. 6–SL equipment	30–68
(5) Safety valve for HSC and No. 24–RL equipment	30–75
(6) Reducing valve for independent or straight air brake	30–50
(7) Self-lapping portion for electro-pneumatic brake (minimum full application pressure)	50
(8) Self-lapping portion for independent air brake (full application pressure)	30–72
(9) Reducing valve for air signal	40–60
(10) Reducing valve for high-speed brake (minimum)	50
CARS	
(11) Reducing valve for high-speed brake	58–62
(12) Safety valve for PS, LN, UC, AML, AMU and AB–1–B air brakes	58–62
(13) Safety valve for HSC air brake	58–77
(14) Governor valve for water raising system	60
(15) Reducing valve for water raising system	20–30

§ 232.105 General requirements for locomotives.

(a) The air brake equipment on locomotives shall be in safe and suitable condition for service.

(b) Except for locomotives ordered before January 1, 1999, or placed in service for the first time before January 1, 2001, all locomotives shall be equipped with a hand or parking brake that shall be:

(1) Capable of application or activation by hand;

(2) Capable of release by hand; and

(3) Capable of holding the loaded unit on the maximum grade anticipated by the operating railroad.

(c) On locomotives so equipped, the hand or parking brake as well as its parts and connections shall be inspected, and necessary repairs made as often as service requires but no less frequently than every 368 days. The locomotive shall be suitably stenciled or tagged with the date of the last inspection.

(d) The equalizing reservoir on locomotives and related piping leakage shall be zero. If such leakage occurs en route, the train may be moved only to the nearest forward location where the equalizing reservoir leakage can be corrected.

(e) Use of the feed or regulating valve to control braking is prohibited.

(f) The passenger position on the locomotive brake control stand shall only be used if the trailing equipment is designed for graduated brake release or if equalizing reservoir leakage occurs en route and its use is necessary to safely control the movement of the train until the next forward location where the reservoir leakage can be corrected.

§ 232.107 Air source requirements and cold weather operations.

(a) *Monitoring plans for yard air sources.* (1) Each railroad shall adopt, comply with, and make available to FRA upon request a plan to monitor all yard air sources, other than locomotives, to ensure that they operate as intended and do not introduce contaminants into the brake system of freight equipment.

(2) This plan shall require the railroad to:

(i) Routinely inspect each yard air source to ensure it operates as intended and does not introduce contaminants into the brake system of the equipment it services.

(ii) Identify yard air sources found not to be operating as intended or found to have the potential of introducing contaminants into the brake system of the equipment it services.

(iii) Repair or take other remedial action regarding any yard air source identified under paragraph (a)(2)(ii) of this section.

(iv) Assess the effectiveness of the remedial action described in paragraph (a)(2)(iii) of this section.

(v) Record detailed information about the actions required by paragraphs (a)(2)(i) through (a)(2)(iv) of this section.

(3) The records required by paragraph (a)(2) shall be maintained for a period of at least one year from the date of creation.

(b) Condensation and other contaminants shall be blown from the pipe or hose from which compressed air is taken prior to connecting the yard air line or motive power to the train.

(c) No chemicals shall be placed in the train air brake system.

(d) Yard air reservoirs shall either be equipped with an operable automatic drain system or shall be manually drained at least once each day that the devices are used or more often if moisture is detected in the system.

(e) A railroad shall adopt, comply with, and make available to FRA upon request detailed written operating procedures tailored to the equipment and territory of that railroad to cover safe train operations during cold weather situations. For purposes of this provision cold weather means when the ambient temperature drops below 10 degrees Fahrenheit (F)(minus 12.2 degrees Celsius).

§ 232.109 Dynamic brake requirements.

(a) A locomotive engineer shall be informed in writing of the operational status of the dynamic brakes on all locomotive units in the consist at the initial terminal or point of origin for a train and at other locations where a locomotive engineer first takes charge of a train.

(b) Except as provided in paragraph (d) of this section, all inoperative or ineffective dynamic brakes shall be repaired within 30 calendar days of becoming inoperative or at the locomotive's next periodic inspection pursuant to § 229.23 of this chapter, whichever occurs first.

(c) Except as provided in paragraph (d) of this section, a locomotive discovered with inoperative dynamic brakes shall have a tag bearing the words ''inoperative dynamic brake'' securely attached and displayed in a conspicuous location in the cab of the locomotive. This tag shall contain the following information:

(1) The locomotive number;

(2) The name of the discovering carrier;

(3) The location and date where condition was discovered; and

(4) The signature of the person discovering the condition.

(d) A railroad may elect to declare the dynamic brakes on a locomotive deactivated without removing the dynamic brake components from the locomotive, only if all of the following conditions are met:

(1) The locomotive is clearly stenciled with the words ''dynamic brake deactivated'' in a conspicuous location on the outside of the locomotive and in the cab of the locomotive;

(2) The railroad has taken appropriate action to ensure that the deactivated locomotive is incapable of utilizing dynamic brake effort to retard or control train speed; however, if the subject locomotive is placed in the controlling (lead) position of the consist, that locomotive must be capable of controlling dynamic braking effort in trailing locomotives in the consist that are so equipped.

(e) Each railroad operating a train with a brake system that includes dynamic brakes shall adopt, comply with, and make available to FRA upon request written operating rules governing safe train handling procedures using these dynamic brakes under all operating conditions, which shall be tailored to the specific equipment and territory of the railroad. The railroad's operating rules shall be based on the premise that the friction brakes are sufficient by themselves, without the aid of dynamic brakes, to stop the train safely under all operating conditions.

(f) Each railroad operating a train with a brake system that includes dynamic brakes shall adopt, comply with, and incorporate into its locomotive engineer certification program pursuant to part 240 of this chapter, specific knowledge, skill, and ability criteria to ensure that its locomotive engineers are fully trained in the operating rules prescribed by paragraph (e) of this section.

§ 232.111 Train information handling.

(a) Each railroad shall adopt, comply with, and make available to FRA upon request written procedures to ensure that a train crew employed by the railroad is given accurate information on the condition of the train brake system and train factors affecting brake system performance and testing when the crew takes over responsibility for the train.

(b) The procedures shall provide that each train crew coming on duty be informed of:

(1) The total weight and length of the train;

(2) Any special weight distribution that would require special train handling procedures;

(3) The number and location of cars with cut-out or otherwise ineffective brakes and the location where they will be repaired;

(4) If a Class I or Class IA brake test is required prior to the next crew change point, the location at which that test shall be performed;

(5) A record of train configuration changes since the last Class I brake test; and

(6) Any train brake system problems encountered by the previous crew of the train.

Subpart C—Inspection and Testing Requirements

§ 232.201 Scope.

This subpart contains the inspection and testing requirements for brake systems used in freight and other non-passenger trains. This subpart also contains general training requirements for railroad and contract personnel used to perform the required inspections and tests.

§ 232.203 Training requirements.

(a) Each railroad shall adopt, comply with, and make available to FRA upon request a training, qualification, and designation program for employees and contractors that perform brake system inspections, tests, or maintenance. For purposes of this section, a ''contractor'' is defined as a person under contract with the railroad or car owner or an employee of a person under contract with the railroad or car owner.

(b) As part of this program, the railroad shall:

(1) Identify the tasks related to the inspection, testing, and maintenance of the brake system required by this part that must be performed on each type of equipment that the railroad operates;

(2) Develop written procedures for the performance of the tasks identified;

(3) Identify the skills and knowledge necessary to perform each task;

(4) Develop or incorporate a training curriculum that includes both classroom and ''hands-on'' lessons designed to impart the skills and knowledge identified as necessary to perform each task. The developed or incorporated training curriculum shall specifically address the Federal regulatory requirements contained in this part that are related to the performance of the tasks identified;

(5) Require all employees and contractors to successfully complete the training course that covers the equipment and tasks for which they are responsible as well as the specific Federal regulatory requirements contained in this part related to equipment and tasks for which they are responsible;

(6) Require all employees and contractors to pass a written or oral

examination covering the equipment and tasks for which they are responsible as well as the specific Federal regulatory requirements contained in this part related to equipment and tasks for which they are responsible;

(7) Require all employees and contractors to individually demonstrate ''hands-on'' capability by successfully performing all of the tasks required to be performed as part of their duties on the type equipment to which they are assigned to the satisfaction of their supervisor or designated instructor;

(8) Require supervisors to exercise oversight to ensure that all the identified tasks are performed in accordance with the railroad's written procedures;

(9) Require periodic refresher training at an interval not to exceed three years that includes classroom and ''hands-on'' training, as well as testing; and (10) Add new equipment to the training, qualification and designation program prior to its introduction to revenue service.

(c) Each railroad that operates trains required to be equipped with a two-way end-of-train telemetry device pursuant to subpart E of this part, shall adopt, comply with, and make available to FRA upon request a training program which specifically addresses the testing, operation, and maintenance of two-way end-of-train devices for employees and contractors that are responsible for the testing, operation, and maintenance of the devices.

(d) A railroad shall maintain adequate records to demonstrate the current qualification status of all of its personnel—including contract personnel—assigned to inspect, test, or maintain a train brake system. These records shall include the following information concerning each such employee of the railroad or of a contractor for the railroad:

(1) The name of the railroad employee or contractor employee;

(2) The dates that each training course was completed;

(3) The content of each training course successfully completed;

(4) The scores on each test taken to demonstrate proficiency;

(5) A description of the employees ''hands-on'' performance of the tasks for which the employee is assigned and the basis for finding that the tasks were successfully completed.

(6) A record that the railroad employee or contractor employee was notified of his or her current qualification status and of any subsequent changes to that status;

(7) The type of equipment the person is qualified to inspect, test, or maintain;

(8) A statement signed by the railroad's chief mechanical officer, chief operating officer, or their designee, that the person meets the minimum qualification standards as set forth in this subpart; and

(9) The date that the person's status as qualified expires due to the need for refresher training.

(e) Each railroad shall adopt, comply with, and make available to FRA upon request an internal audit process to periodically review and evaluate the effectiveness of the training, qualification, and designation program required by this section.

(f) Railroad or contract supervisors shall be held jointly responsible with inspectors and train crew members for the condition and proper functioning of train brake systems.

§ 232.205 Class I brake test—Initial terminal inspection.

(a) Each train and each car in the train shall receive a Class I brake test as described in paragraph (b) of this section by a qualified person, as defined in § 232.5, at the following points:

(1) The location where the train is originally assembled ''initial terminal'' or ''point of origin';

(2) A location where the train consist is changed other than by:

(i) Adding a single car or a solid block of cars;

(ii) Removing a single car or a solid block of cars; or (iii) A combination of the changes listed in paragraphs (a)(2)(i) and (a)(2)(ii) (See §§ 232.209 and 232.211 for requirements related to the pick-up of cars en route.)

(3) A location where the train is off air for a period of more than four hours;

(4) A point where a train has traveled 3,000 miles since its last Class I brake test; and (5) A location where the train is received in interchange if the train consist is changed other than by:

(i) Removing a car or a solid block of cars from the train;

(ii) Adding a previously tested car or a previously tested solid block of cars to the train;

(iii) Changing motive power;

(iv) Removing or changing the caboose; or

(v) Any combination of the changes listed in paragraph (a)(5).

(A) If changes other than those contained in paragraph (a)(5) are made to the train consist when it is received in interchange and the train will move 20 miles or less, then the railroad may conduct a brake test pursuant to § 232.209 on those cars added to the train.

(B) [Reserved]

(b) A Class I brake test shall consist of the following tasks and requirements:

(1) Brake pipe leakage shall not exceed 5 psi per minute or air flow shall not exceed 60 cubic feet per minute (CFM).

(i) *Leakage Test.* The brake pipe leakage test shall be conducted as follows:

(A) Charge the air brake system to within 15 psi of the setting of the feed or regulating valve on the locomotive, but to not less than 75 psi, as indicated by an accurate gauge or end-of-train device at the rear end of train;

(B) Upon receiving the signal to apply brakes for test, make a 20-psi brake pipe service reduction;

(C) If the locomotive used to perform the brake test is equipped with a means for maintaining brake pipe pressure at a constant level during a 20-psi brake pipe service reduction, this feature shall be cut out during the brake test; and

(D) With the brake valve lapped and the pressure maintaining feature cut out (if so equipped) and after waiting 45–60 seconds, note the brake pipe leakage as indicated by the brake-pipe gauge in the locomotive, which shall not exceed 5 psi per minute.

(ii) *Air Flow Method Test.* When locomotives are equipped with a 26–L brake valve or equivalent, a railroad may use the Air Flow Method Test as an alternate to the brake pipe leakage test. The Air Flow Method (AFM) Test shall be performed as follows:

(A) Charge the air brake system to within 15 psi of the setting of the feed or regulating valve, but to not less than 75 psi, as indicated by an accurate gauge or end-of-train device at rear end of train; and

(B) Measure air flow as indicated by a calibrated AFM indicator, which shall not exceed 60 cubic feet per minute (CFM).

(iii) The AFM indicator shall be calibrated for accuracy at periodic intervals not to exceed 92 days. The AFM indicator calibration test orifices shall be calibrated at temperatures of not less than 20 degrees Fahrenheit. AFM indicators shall be accurate to within ±3 standard cubic feet per minute (cfm).

(2) The inspector shall position himself/herself, taking positions on each side of each car sometime during the inspection process, so as to be able to examine and observe the functioning of all moving parts of the brake system on each car in order to make the determinations and inspections required by this section. A ''roll-by'' inspection of the brake release as provided for in paragraph (b)(8) of this section shall not constitute an inspection of that side of the train for purposes of this requirement.

(3) The train brake system shall be charged to within 15 psi of the setting of the feed-regulating valve, but to not less than 75 psi, angle cocks and cutout cocks shall be properly positioned, air hoses shall be properly coupled and shall not kink, bind, or foul or be in any other condition that restricts air flow. An examination must be made for leaks and necessary repairs made to reduce leakage to a minimum. Retaining valves and retaining valve pipes shall be inspected and known to be in condition for service.

(4) The brakes on each car shall apply in response to a 20-psi brake pipe service reduction and shall remain applied until a release of the air brakes has been initiated by the controlling locomotive or yard test device. The brakes shall not be applied or released until the proper signal is given. Freight cars found with brakes that fail to remain applied due to a readily identifiable condition or problem may be retested and remain in the train if the retest is conducted from the controlling locomotive or head end of the consist and the brakes remain applied for a period of at least five minutes.

(5) Piston travel shall be within 7 to 9 inches for 8½-inch and 10-inch diameter brake cylinders or within the piston travel stenciled or marked on car or badge plate for other types. If piston travel is found to be less than 7 inches or more than 9 inches, it must be adjusted to nominally 7½ inches. Minimum brake cylinder piston travel of truck-mounted brake cylinders must be sufficient to provide proper brake shoe clearance when the brakes are released. Piston travel must be inspected on each freight car while the brakes are applied.

(6) Brake rigging shall be properly secured and shall not bind or foul or otherwise adversely affect the operation of the brake system.

(7) All parts of the brake equipment shall be properly secured. On freight cars where the bottom rod passes through the truck bolster or is secured with cotter keys equipped with a locking device to prevent their accidental removal, bottom rod safety supports are not required.

(8) When the release is initiated by the controlling locomotive or yard test device, the brakes on each freight car shall be inspected to verify that it did release; this may be performed by a ''roll-by'' inspection. If a ''roll-by'' inspection of the brake release is performed, train speed shall not exceed 10 MPH and the qualified person performing the ''roll-by'' inspection shall communicate the results of the inspection to the operator of the train. The operator of the train will note successful completion of the release portion of the inspection on the written notification required in paragraph (c) of this section.

(c) Where a railroad's collective bargaining agreement provides that only a carman is to perform the inspections and tests required by this section, a carman alone will be considered a qualified person. In these circumstances, the railroad shall ensure that the carman is properly trained and designated as a qualified person or qualified mechanical inspector pursuant to the requirements of this part.

(d) A qualified person participating in the test and inspection required by this section shall notify the locomotive engineer in writing or place such notification in the cab of the controlling locomotive that the Class I brake test has been satisfactorily performed. The written or electronic notification shall be retained in the cab of the controlling locomotive until the train until reaches its destination and shall contain the date, time, number of freight cars inspected, and location where the Class I brake test was performed.

(e) Before adjusting piston travel or working on brake rigging, cutout cock in brake pipe branch must be closed and air reservoirs must be voided of all air. When cutout cocks are provided in brake cylinder pipes, these cutout cocks only may be closed and air reservoirs need not be voided of all air.

(f) Except as provided in § 232.209, each car or solid block of cars, as defined in § 232.5, that has not received a Class I brake test or that has been off air for more than four hours and that is added to a train shall receive a Class I test when added to a train. A Class III brake test as described in § 232.211 shall then be performed on the entire new train.

§ 232.207 Class IA brake tests—1,000-mile inspection.

(a) Except as provided in § 232.213, each train shall receive a Class IA brake test performed by a qualified person, as defined in § 232.5, at a location that is not more than 1,000 miles from the point where any freight car in the train last received a Class I or Class IA brake test. The most restrictive car or block of cars in the train shall determine the location of this test.

(b) A Class IA brake test shall consist of the following tasks and requirements:

(1) Brake pipe leakage shall not exceed 5 psi per minute or air flow shall not exceed 60 cubic feet per minute (CFM). The brake pipe leakage test or air flow method test shall be conducted pursuant to the requirements contained in § 232.205(b)(1);

(2) The inspector shall position himself/herself, taking positions on each side of each car sometime during the inspection process, so as to be able to examine and observe the functioning of all moving parts of the brake system on each car in order to make the determinations and inspections required by this section;

(3) The air brake system shall be charged to within 15 psi of the setting of the feed or regulating valve, but to not less than 75 psi, as indicated by an accurate gauge or end-of-train device at rear end of train.

(4) The brakes on each car shall apply in response to a 20-psi brake pipe service reduction and shall remain applied until the release is initiated by the controlling locomotive. Cars found with brakes that fail to remain applied due to a readily identifiable condition or problem may be retested and remain in the train if the retest is conducted from the controlling locomotive or head end of the consist and the brakes remain applied for a period of at least five minutes; otherwise, the defective equipment may only be moved pursuant to the provisions contained in § 232.15, if applicable;

(5) Brake rigging shall be properly secured and shall not bind or foul or otherwise adversely affect the operation of the brake system; and

(6) All parts of the brake equipment shall be properly secured.

(c) Each railroad shall designate the locations where Class IA brake tests will be performed and the carrier shall furnish to the Federal Railroad Administration upon request a description of each location designed, and shall notify in writing FRA's Associate Administrator for Safety 30 days prior to any change in the locations designated for such tests and inspections.

(1) Failure to perform a Class IA brake test at a location designated pursuant to this paragraph will constitute a failure to perform a proper Class IA brake test.

(2) In the event of an emergency that alters normal train operations such as a derailment or other unusual circumstance that reflects on the safe operation of the train, the railroad would not be required to provide prior written notification of a change in the location where a Class IA brake test is performed, provided; that the railroad notifies FRA's Associate Administrator for Safety and the pertinent FRA Regional Administrator within 24 hours after the designation has been changed and the reason for that change.

§ 232.209 Class II brake tests—Intermediate inspection.

(a) At a location other than the point of origin (initial terminal) of a train, each car or solid block of cars, as defined in § 232.5, that has not received a Class I brake test or that has been off air for more than four hours and that is added to a train shall receive a Class II brake test when added to the train.

(b) A Class II brake test shall consist of the following tasks and requirements:

(1) Brake pipe leakage shall not exceed 5 psi per minute or air flow shall not exceed 60 cubic feet per minute (CFM). The brake pipe leakage test or air flow method test shall be conducted pursuant to the requirements contained in § 232.205(b)(1);

(2) The air brake system shall be charged to within 15 psi of the setting of the feed or regulating valve, but to not less than 75 psi, as indicated by an accurate gauge or end-of-train device at rear end of train.

(3) The brakes on each car added to the train and on the rear car of the train shall apply in response to a 20-psi brake pipe service reduction and shall remain applied until the release is initiated from the controlling locomotive. Cars found with brakes that fail to remain applied due to a readily identifiable condition or problem may be retested and remain in the train if the retest is conducted from the controlling locomotive or head end of the consist and the brakes remain applied for a period of at least five minutes; otherwise, the defective equipment may only be moved pursuant to the provisions contained in § 232.15, if applicable;

(4) When the release is initiated, the brakes on each car added to the train and on the rear car of the train shall be inspected to verify that it did release; this may be performed by a ''roll-by'' inspection. If a ''roll-by'' inspection of the brake release is performed, train speed shall not exceed 10 MPH and the qualified person performing the ''roll-by'' inspection shall communicate the results of the inspection to the operator of the train.

(5) Before the train proceeds the operator of the train shall know that the brake pipe pressure at the rear of the train is being restored.

(c) As an alternative to the rear car brake application and release portion of the test, the operator of the train shall determine that brake pipe pressure of the train is being reduced as indicated by a rear car gauge or end-of-train telemetry device and then that brake pipe pressure of the train is being restored as indicated by a rear car gauge or end-of-train telemetry device. (When an end-of-train telemetry device is used to comply with any test requirement in this part, the phrase ''brake pipe pressure of the train is being reduced'' means a pressure reduction of at least 5 psi, and the phrase ''brake pipe pressure of the train is being restored'' means a pressure increase of at least 5 psi). If an electronic communication link between a controlling locomotive and a remotely controlled locomotive attached to the rear end of a train is utilized to determine that brake pipe pressure is being restored, the operator of the train shall know that the air brakes function as intended on the remotely controlled locomotive.

(d) Each car or solid block of cars, as defined in § 232.5, that has not received a Class I brake test or that has been off air for more than four hours that receives a Class II brake test when added to the train shall receive a Class I brake test at the next forward location where facilities are available for performing such a test. A Class III brake test as described in § 232.211 shall then be performed on the entire train.

§ 232.211 Class III brake tests—Trainline continuity inspection.

(a) A Class III brake test shall be performed on a train to test the train brake system when a train has changed configuration. A Class III brake test shall be performed when any of the following occur:

(1) Where a locomotive or a caboose is changed;

(2) Where a car or a block of cars is removed from the train with the consist otherwise remaining intact;

(3) At a point other than the point of origin (initial terminal) for a train, where a car or a solid block of cars that has received a Class I brake test and that has not been off air for more than four hours is added to a train; or

(4) Whenever the continuity of the brake pipe is broken or interrupted.

(b) A Class III brake test shall consist of the following tasks and requirements:

(1) The train brake system shall be charged to within 15 psi of the feed-valve setting on the locomotive, but not less than 75 psi, as indicated at the rear of the train by an accurate gauge or end-of-train device;

(2) The brakes on the rear car of the train shall apply in response to a 20-psi brake pipe service reduction and shall remain applied until the release is initiated by the controlling locomotive;

(3) When the release is initiated, the brakes on the rear car of the train shall be inspected to verify that it did release;

(4) Before proceeding the operator of the train shall know that the brake pipe pressure at the rear of freight train is being restored.

(c) As an alternative to the rear car brake application and release portion of the test, it shall be determined that brake pipe pressure of the train is being reduced as indicated by a rear car gauge or end-of-train telemetry device and then that brake pipe pressure of the train is being restored as indicated by a rear car gauge or end-of-train telemetry device. If an electronic or radio communication link between a controlling locomotive and a remotely controlled locomotive attached to the rear end of a train is utilized to determine that brake pipe pressure is being restored, the operator of the train shall know that the air brakes function as intended on the remotely controlled locomotive.

§ 232.213 Extended haul trains.

(a) A railroad may be permitted to move a train up to, but not exceeding, 1,500 miles between brake tests and inspections if the railroad designates a train as a priority train. In order for a railroad to designate a train as an extended haul train, all of the following requirements must be met:

(1) The railroad must designate the train in writing to FRA's Associate Administrator for Safety. This designation must include the following:

(i) The train identification symbol;

(ii) The origination and destination points for the train;

(iii) The type or types of equipment the train will haul; and

(iv) The locations where all train brake and mechanical inspections and tests will be performed.

(2) A Class I brake test pursuant to § 232.205 shall be performed at the train's point of origin by a qualified mechanical inspector as defined in § 232.5.

(3) A freight car inspection pursuant to part 215 of this chapter shall be performed at the train's point of origin and shall be performed by an inspector designated under § 215.11 of this chapter.

(4) All cars containing non-complying conditions under part 215 of this chapter at the train's point of origin shall either be repaired or removed from the train. Except for cars developing conditions en route, no car shall be moved pursuant to the provisions of § 215.9 of this chapter in the train.

(5) The train shall have no pick-ups or set-outs en route, except for the set-out of defective equipment pursuant to the requirements of this chapter.

(6) At the point of destination, if less than 1,500 miles, or at the point designated by the railroad pursuant to

paragraph (a)(1)(iv) of this section, not to exceed 1,500 miles, an inbound inspection of the train shall be conducted by a qualified mechanical inspector to identify any defective, inoperative, or ineffective brakes or any other condition not in compliance with this part as well as any conditions not in compliance with part 215 and part 231 of this chapter.

(7) The railroad shall maintain a record of all defective, inoperative, or ineffective brakes as well as any conditions not in compliance with part 215 and part 231 of this chapter discovered at anytime during the movement of the train. These records shall be retained for a period of one year and made available to FRA upon request.

(8) In order for an extended haul train to proceed beyond 1,500 miles, the following requirements shall be met:

(i) If the train will move 1,000 miles or less from that location before receiving a Class IA brake test or reaching destination, a Class I brake test shall be conducted pursuant to § 232.205 to ensure 100 percent effective and operative brakes. The inbound inspection required by paragraph (a)(6) of this section may be used to meet this requirement provided it encompasses all the inspection elements contained in § 232.205.

(ii) If the train will move greater than 1,000 miles from that location without another brake inspection, the train must be identified as an extended haul train for that movement and shall meet all the requirements contained in paragraphs (a)(1) through (a)(7) of this section. Such trains shall receive a Class I brake test pursuant to § 232.205 by a qualified mechanical inspector to ensure 100 percent effective and operative brakes, a freight car inspection pursuant to part 215 of this chapter by an inspector designated under § 215.11 of this chapter, and all cars containing non-complying conditions under part 215 of this chapter shall either be repaired or removed from the train. The inbound inspection required by paragraph (a)(6) of this section may be used to meet these inspection requirements provided it encompasses all the inspection elements contained in paragraphs (a)(2) through (a)(4) of this section.

(9) FRA inspectors shall have physical access to visually observe all brake and freight car inspections and tests required by this section.

(b) Failure to comply with any of the requirements contained in paragraph (a) of this section will be considered an improper movement of a designated priority train for which appropriate civil penalties may be assessed as outlined in Appendix A to this part. Furthermore, FRA's Associate Administrator for Safety may revoke a railroad's ability to designate any or all trains as extended haul trains for repeated or willful noncompliance with any of the requirements contained in this section. Such a determination will be made in writing and will state the basis for such action.

§ 232.215 Transfer train brake tests.

(a) A transfer train, as defined in § 232.5, shall receive a test that includes the following:

(1) The air brake hoses shall be coupled between all freight cars.

(2) After the brake system is charged to not less than 60 psi as indicated by an accurate gauge or end-of-train device at the rear of the train, a 15-psi service brake pipe reduction shall be made.

(3) An inspection shall be made to determine that the brakes on each car apply and remain applied until the release is initiated by the controlling locomotive. Cars found with brakes that fail to remain applied due to a readily identifiable condition or problem may be retested and remain in the train if the retest is conducted from the controlling locomotive or head end of the consist and the brakes remain applied for a period of at least five minutes; otherwise, the defective equipment may only be moved pursuant to the provisions contained in § 232.15, if applicable;

(b) If a train's movement will exceed 20 miles or is not a transfer train as defined in § 232.5, the train shall receive a Class I brake test in accordance with § 232.205 prior to departure.

§ 232.217 Train brake system tests conducted using yard air.

(a) When a train air brake system is tested from a yard air, an engineer's brake valve or a suitable test device shall be used to provide any increase or reduction of brake pipe air pressure at the same, or slower, rate as an engineer's brake valve, and the yard air must be connected to the end of the train or cut of cars that will be nearest to the controlling locomotive.

(b) When a yard air is used, the train air brake system must be charged and tested as prescribed by § 232.205(b) and when practicable should be kept charged until road motive power is coupled to train, after which, a Class III brake test shall be performed as prescribed by § 232.211.

(1) If the cars are off air for more than four hours, these cars shall be retested in accordance with § 232.205 (b) through (e).

(2) Yard air pressure shall be 80 psi.

(c) Mechanical yard air test devices and gauges shall be calibrated every 92 days. Electronic yard test devices and gauges shall be calibrated annually. Gauges or other devices providing air-pressure control shall be accurate to within ± 3 psi.

(d) If used to test a train, a yard air test device and any yard air test equipment shall be accurate and function as intended.

§ 232.219 Double heading, helper service, and distributed power.

(a) When more than one locomotive is attached to a train, the engineer of the controlling locomotive shall operate the brakes. On all other motive power units in the train the brake pipe cutout cock to the brake valve must be closed, the maximum main reservoir pressure maintained and brake valve handles kept in the prescribed position. In case it becomes necessary for the controlling locomotive to give up control of the train short of the destination of the train, a Class III brake test pursuant to § 232.211 shall be made to ensure that the brakes are operative from the automatic brake valve of the locomotive taking control of the train.

(b) The electro-pneumatic brake valve on all motive power units other than that which is handling the train shall be cut out, the handle of brake valve kept in the prescribed position, and the air compressors kept running if practicable.

(c) When one or more helper locomotives are placed in a train, a visual inspection shall be made of each helper locomotive brake system to determine that the brake system operates as intended in response to a 20-psi reduction initiated from the controlling locomotive of the train. A helper locomotive with inoperative or ineffective brakes shall be repaired prior to use or removed from the train.

Subpart D—Periodic Maintenance and Testing Requirements

§ 232.301 Scope.

This subpart contains the periodic brake system maintenance and testing requirements for equipment used in freight and other non-passenger trains.

§ 232.303 General requirements.

(a) Except as provided in paragraphs (b) through (d) of this section, § 232.305, and § 232.307, each car shall be maintained, repaired, and tested in accordance with Association of American Railroads Rule 3 ''Testing of Air Brakes'' and accompanying Chart A, contained in the AAR ''Field Manual on Interchange Rules'' (January 1, 1998).

(b) All cars on a shop or repair track shall be tested to determine that the air

brakes apply and remain apply applied until a release is initiated.

(c) All cars on a shop or repair track shall have piston travel inspected to ensure it is within 7 to 9 inches for 8–½-inch and 10-inch diameter brake cylinders or within the piston travel stenciled or marked on car or badge plate for other types. If piston travel is found to be less than 7 inches or more than 9 inches it must be adjusted to nominally 7½ inches. Piston travel for cars equipped with other than 8–½-inch and 10-inch diameter brake cylinders shall be adjusted as indicated on the badge plate, stencil, or sticker on the car.

(d) Before a car is released from a shop or repair track, a qualified person shall know:

(1) The brake pipe is securely clamped;

(2) Angle cocks are properly located with suitable clearance and properly positioned to allow maximum air flow; and (3) Valves, reservoirs, and cylinders are tight on supports and the supports are securely attached to the car.

(e) If the repair track brake test or single car test required in §§ 232.305 and 232.307 cannot be conducted at the point where repairs can be made to the car, the car may be moved after the repairs are effectuated to the next forward location where the test can be performed. Inability to perform a repair track brake test or single car test does not constitute an inability to effectuate the necessary repairs.

(1) If it is necessary to move a car from the location where the repairs are performed in order to perform a repair track brake test or a single car test required by this part, a tag or card shall be placed on both sides of the equipment, or an automated tracking system approved for use by FRA, with the following information about the equipment:

(i) The reporting mark and car number;

(ii) The name of the inspecting railroad;

(iii) The location where repairs were performed and date;

(iv) Indication whether the car requires a repair track brake test or single car test;

(v) The location where the appropriate test is to be performed; and (vi) The name, signature, if possible, and job title of the qualified person approving the move.

(2) The tag or card required by paragraph (e)(1) of this section shall remain affixed to the equipment until the necessary test has been performed.

(3) A record or copy of each tag or card attached to or removed from a car or locomotive shall be retained for 90 days and, upon request, shall be made available within 15 calendar days for inspection by FRA or State inspectors.

(4) Each tag or card removed from a car or locomotive shall contain the date, location, and the signature of the person who removed it from the piece of equipment.

(f) The location and date of the last repair track brake test or single car test required by §§ 232.305 and 232.307 shall be clearly stenciled, marked, or labeled in two-inch high letters or numerals on the side of the equipment. Alternatively, the railroad may use an electronic record keeping system approved for use by FRA's Associate Administrator for Safety in writing.

§ 232.305 Repair track brake tests.

(a) Repair track brake tests shall be performed by a qualified person in accordance with the Association of American Railroads standard S–486, Section 3.0, contained in the AAR ''Manual of Standards and Recommended Practices, Section E, Part II'' (November 1992).

(b) Except as provided in § 232.303 (e), a railroad shall perform a repair track brake test on a car when:

(1) A car is removed from a train due to an air brake related defect;

(2) A car has its brakes cut-out when removed from a train or when placed on a shop or repair track;

(3) A car is on a repair or shop track for any reason and has not received a repair track brake test within the previous 12 month period;

(4) A car is found with missing or incomplete repair track brake test information;

(5) One or more of the following conventional air brake equipment items is removed, repaired, or replaced:

(i) Brake reservoir;

(ii) Control valve mounting gasket; or

(iii) Pipe bracket stud.

(6) A car is found with one or more of the following wheel defects:

(i) Built-up tread;

(ii) Slid flat wheel; or

(iii) Thermal cracks.

(c) Except as provided in paragraph (d) of this section each car shall receive a repair track brake test no less than every 5 years.

(d) Each car shall receive a repair track brake test no less than 8 years from the date the car was built or rebuilt.

§ 232.307 Single car tests.

(a) Single car tests shall be performed by a qualified person in accordance with the Association of American Railroads standard S–486, Section 4.0, contained in the AAR ''Manual of Standards and Recommended Practices, Section E, Part II'' (November 1992).

(b) Except as provided in § 232.303(e), a railroad shall perform a single car test on a car when one or more of the following conventional air brake equipment items is removed, repaired or replaced:

(1) Service portion;

(2) Emergency portion; or

(3) Pipe bracket.

(c) A single car test pursuant to paragraph (a) of this section shall be performed on a new or rebuilt car prior to placing or using the car in revenue service.

§ 232.309 Repair track brake test and single car test equipment and devices.

(a) All test equipment and devices used to perform repair track brake tests or single car tests shall be tested for correct operation at least once each calendar day of use.

(b) Mechanical test devices such as pressure gauges, flow meters, orifices, etc. shall be calibrated once every 92 days.

(c) Electronic test devices shall be calibrated at least once every 365 days.

(d) All test equipment and devices shall be tagged or labeled with the date its next calibration is due.

(e) The single car test device must be tested not less frequently than every 92 days.

(f) The single car test device must be disassembled and cleaned not less frequently than every 365 days.

§ 232.311 Process for changing maintenance requirements.

(a) The Association of American Railroads standards incorporated by reference in subpart D of this part may only be changed if the provisions contained in this section are followed.

(b) The AAR shall submit a petition for proposed revision of the standards and any supporting documentation to FRA's Associate Administrator for Safety.

(c) The petition for proposed revision submitted by AAR shall contain a recommendation as to whether the proposed revision should be considered ''safety-critical'' or nonsafety-critical.

(1) For purposes of this section, safety-critical revisions include but are not limited to the following:

(i) Changes to Chart A contained in Rule 3 of AAR ''Field Manual on Interchange Rules'' (January 1, 1998);

(ii) Changes that extend the intervals for performing specified maintenance or repair; and

(iii) Changes that reduce the quality or quantity of maintenance provided.

(2) For purposes of this section, nonsafety-critical revisions include but are not limited to the following:

(i) Clarifying amendments;

(ii) Changes that shorten the intervals at which maintenance or repairs are performed; and

(iii) Procedural changes that do not reduce the quality or quantity of the maintenance provided.

(d) Within 30 days after the submission of a petition for proposed revision, FRA's Associate Administrator for Safety will issue a determination in writing as to whether the proposed change is ''safety critical'' or ''non-safety critical.''

(1) If FRA's Associate Administrator for Safety determines that the proposed change is ''safety critical,'' the petition for proposed revision will be treated as a ''petition for special approval'' pursuant to § 232.17.

(2) If FRA's Associate Administrator for Safety determines that the proposed change is ''nonsafety-critical,'' the petition for proposed revision may be incorporated by AAR immediately.

Subpart E—End-of-Train Devices

§ 232.401 Scope.

This subpart contains the requirements related to the performance, operation, and testing of end-of-train devices. Unless expressly excepted in this subpart, the requirements of this subpart apply to all trains operating on track which is part of the general railroad system of transportation.

§ 232.403 Design standards for one-way end-of-train devices.

(a) A one-way end-of-train device shall be comprised of a rear-of-train unit (rear unit) located on the last car of a train and a front-of-train unit (front unit) located in the cab of the locomotive controlling the train.

(b) *Rear unit.* The rear unit shall be capable of determining the rear car brake pipe pressure and transmitting that information to the front unit for display to the locomotive engineer. The rear unit shall be—

(1) Capable of measuring the rear car brake pipe pressure with an accuracy of ±3 psig and brake pipe pressure variations of ±1 psig;

(2) Equipped with a ''bleeder valve'' that permits the release of any air under pressure from the rear of train unit or the associated air hoses prior to detaching the rear unit from the brake pipe;

(3) Designed so that an internal failure will not cause an undesired emergency brake application;

(4) Equipped with either an air gauge or a means of visually displaying the rear unit's brake pipe pressure measurement; and

(5) Equipped with a pressure relief safety valve to prevent explosion from a high pressure air leak inside the rear unit.

(c) *Reporting rate.* Multiple data transmissions from the rear unit shall occur immediately after a variation in the rear car brake pipe pressure of ±2 psig and at intervals of not greater than 70 seconds when the rear car brake pipe pressure variation over the 70-second interval is less than ±2 psig.

(d) *Operating environment.* The rear unit shall be designed to meet the performance requirements of paragraphs (b) and (c) of this section under the following environmental conditions:

(1) At temperatures from −40 °C to 60 °C;

(2) At a relative humidity of 95% noncondensing at 50 °C;

(3) At altitudes of zero to 12,000 feet mean sea level;

(4) During vertical and lateral vibrations of 1 to 15 Hz., with 0.5 g. peak to peak, and 15 to 500 Hz., with 5 g. peak to peak;

(5) During the longitudinal vibrations of 1 to 15 Hz., with 3 g. peak to peak, and 15 to 500 Hz., with 5 g. peak to peak; and (6) During a shock of 10 g. peak for 0.1 second in any axis.

(e) *Unique code.* Each rear unit shall have a unique and permanent identification code that is transmitted along with the pressure message to the front-of-train unit. A code obtained from the Association of American Railroads, 50 F Street, NW., Washington, DC 20036 shall be deemed to be a unique code for purposes of this section. A unique code also may be obtained from the Office of Safety Assurance and Compliance (RRS–10), Federal Railroad Administration, Washington, DC 20590.

(f) *Front unit.* (1) The front unit shall be designed to receive data messages from the rear unit and shall be capable of displaying the rear car brake pipe pressure in not more than one-pound increments.

(2) The display shall be clearly visible and legible in daylight and darkness from the engineer's normal operating position.

(3) The front device shall have a means for entry of the unique identification code of the rear unit being used. The front unit shall be designed so that it will display a message only from the rear unit with the same code as entered into the front unit.

(4) The front unit shall be designed to meet the requirements of paragraphs (d) (2), (3), (4), and (5) of this section. It shall also be designed to meet the performance requirements in this paragraph—

(i) At temperatures from 0 °C to 60 °C;

(ii) During a vertical or lateral shock of 2 g. peak for 0.1 second; and

(iii) During a longitudinal shock of 5 g. peak for 0.1 second.

(g) *Radio equipment.* (1) The radio transmitter in the rear unit and the radio receiver in the front unit shall comply with the applicable regulatory requirements of the FCC and use of a transmission format acceptable to the FCC.

(2) If power is supplied by one or more batteries, the operating life shall be a minimum of 36 hours at 0 °C.

§ 232.405 Design and performance standards for two-way-end-of-train devices.

Two-way end-of-train devices shall be designed and perform with the features applicable to one-way end-of-train devices described in § 232.403, except those included in § 232.403(b)(3). In addition, a two-way end-of-train device shall be designed and perform with the following features:

(a) An emergency brake application command from the front unit of the device shall activate the emergency air valve at the rear of the train within one second.

(b) The rear unit of the device shall send an acknowledgment message to the front unit immediately upon receipt of an emergency brake application command. The front unit shall listen for this acknowledgment and repeat the brake application command if the acknowledgment is not correctly received.

(c) The rear unit, on receipt of a properly coded command, shall open a valve in the brake line and hold it open for a minimum of 15 seconds. This opening of the valve shall cause the brake line to vent to the exterior.

(d) The valve opening shall have a minimum diameter of ¾ inch and the internal diameter of the hose shall be ⅝ inch to effect an emergency brake application.

(e) The front unit shall have a manually operated switch which, when activated, shall initiate an emergency brake transmission command to the rear unit. The switch shall be labeled ''Emergency'' and shall be protected so that there will exist no possibility of accidental activation.

(f) The availability of the front-to-rear communications link shall be checked automatically at least every 10 minutes.

(g) Means shall be provided to confirm the availability and proper functioning of the emergency valve.

(h) Means shall be provided to arm the front and rear units to ensure the

rear unit responds to an emergency command only from a properly associated front unit.

§ 232.407 Operations requiring use of two-way end-of-train devices; prohibition on purchase of nonconforming devices.

(a) The following definitions are intended solely for the purpose of identifying those operations subject to the requirements for the use of two-way end-of-train devices.

(1) *Heavy grade* means:

(i) For a train operating with 4,000 trailing tons or less, a section of track with an average grade of two percent or greater over a distance of two continuous miles; and

(ii) For a train operating with greater than 4,000 trailing tons, a section of track with an average grade of one percent or greater over a distance of three continuous miles.

(2) *Train* means one or more locomotives coupled with one or more rail cars, except during switching operations or where the operation is that of classifying cars within a railroad yard for the purpose of making or breaking up trains.

(3) *Local train* means a train assigned to perform switching en route which operates with 4,000 trailing tons or less and travels between a point of origin and a point of final destination, for a distance that is no greater than that which can normally be operated by a single crew in a single tour of duty.

(4) *Work train* means a non-revenue service train of 4,000 trailing tons or less used for the administration and upkeep service of the railroad.

(5) *Trailing tons* means the sum of the gross weights—expressed in tons—of the cars and the locomotives in a train that are not providing propelling power to the train.

(b) All trains not specifically excepted in paragraph (e) of this section shall be equipped with and shall use either a two-way end-of-train device meeting the design and performance requirements contained in § 232.405 or a device using an alternative technology to perform the same function.

(c) Each newly manufactured end-of-train device purchased by a railroad after January 2, 1998 shall be a two-way end-of-train device meeting the design and performance requirements contained in § 232.405 or a device using an alternative technology to perform the same function.

(d) Each two-way end-of-train device purchased by any person prior to July 1, 1997 shall be deemed to meet the design and performance requirements contained in § 232.405.

(e) *Exceptions.* The following types of trains are excepted from the requirement for the use of a two-way end-of-train device:

(1) Trains with a locomotive located at the rear of the train that is capable of making an emergency brake application, through a command effected by telemetry or by a crew member in radio contact with the lead (controlling) locomotive;

(2) Trains operating in the push mode with the ability to effectuate an emergency brake application from the rear of the train;

(3) Trains with an operational caboose placed at the rear of the train, carrying one or more crew members, that is equipped with an emergency brake valve;

(4) Trains operating with a secondary, fully independent braking system capable of safely stopping the train in the event of failure of the primary system;

(5) Trains that do not operate over heavy grades and do not exceed 30 mph;

(6) Local trains as defined in paragraph (a)(3) of this section that do not operate over heavy grades;

(7) Work trains as defined in paragraph (a)(4) of this section that do not operate over heavy grades;

(8) Trains that operate exclusively on track that is not part of the general railroad system;

(9) Passenger trains in which all of the cars in the train are equipped with an emergency brake valve readily accessible to a crew member;

(10) Passenger trains that have a car at the rear of the train, readily accessible to one or more crew members in radio contact with the engineer, that is equipped with an emergency brake valve readily accessible to such a crew member; and

(11) Passenger trains that have twenty-four (24) or fewer cars (not including locomotives) in the consist and that are equipped and operated in accordance with the following train-configuration and operating requirements:

(i) If the total number of cars in a passenger train consist is twelve (12) or fewer, a car located no less than halfway through the consist (counting from the first car in the train) must be equipped with an emergency brake valve readily accessible to a crew member;

(ii) If the total number of cars in a passenger train consist is thirteen (13) to twenty-four (24), a car located no less than two-thirds (⅔) of the way through the consist (counting from the first car in the train) must be equipped with an emergency brake valve readily accessible to a crew member;

(iii) Prior to descending a section of track with an average grade of two percent or greater over a distance of two continuous miles, the engineer of the train shall communicate with the conductor, to ensure that a member of the crew with a working two-way radio is stationed in the car with the rearmost readily accessible emergency brake valve on the train when the train begins its descent; and

(iv) While the train is descending a section of track with an average grade of two percent or greater over a distance of two continuous miles, a member of the train crew shall occupy the car that contains the rearmost readily accessible emergency brake valve on the train and be in constant radio communication with the locomotive engineer. The crew member shall remain in this car until the train has completely traversed the heavy grade.

(f) If a train is required to use a two-way end-of-train device:

(1) That device shall be armed and operable from the time a train departs from the point where the device is installed until the train reaches its destination.

(2) The rear unit batteries shall be sufficiently charged at the initial terminal or other point where the device is installed and throughout the train's trip to ensure that the end-of train-device will remain operative until the train reaches its destination.

(3) The device shall be activated to effectuate an emergency brake application either by using the manual toggle switch or through automatic activation, whenever it becomes necessary for the locomotive engineer to place the train air brakes in emergency using either the automatic brake valve or the conductor's emergency brake valve or whenever an undesired emergency application of the train air brakes occurs.

(g) *En route failure of device on a freight or other non-passenger train.* Except on passenger trains required to be equipped with a two-way end-of-train device (which are provided for in paragraph (h) of this section), en route failures of a two-way end-of-train device shall be handled in accordance with this paragraph. If a two-way end-of-train device or equivalent device fails en route (i.e., is unable to initiate an emergency brake application from the rear of the train due to certain losses of communication (front to rear) or due to other reasons), the speed of the train on which it is installed shall be limited to 30 mph until the ability of the device to initiate an emergency brake application from the rear of the train is restored. This limitation shall apply to a train using any device that uses an alternative technology to serve the purpose of a

two-way end-of-train device. With regard to two-way end-of-train devices, a loss of communication between the front and rear units will be considered an en route failure only if the loss of communication is for a period greater than 16 minutes and 30 seconds.

(1) If a two-way end-of-train device fails en route, the train on which it is installed, in addition to observing the 30-mph speed limitation, shall not operate over a section of track with an average grade of two percent or greater over a distance of two continuous miles, unless one of the following alternative measures is provided:

(i) Use of an occupied helper locomotive at the end of the train. This alternative may be used only if the following requirements are met:

(A) The helper locomotive engineer will initiate and maintain two-way voice radio communication with the engineer on the head end of the train; this contact shall be verified just prior to passing the crest the grade.

(B) If there is a loss of communication prior to passing the crest of the grade, the helper locomotive engineer and the head-end engineer shall act immediately to stop the train until voice communication is resumed, if this can be done safely.

(C) If there is a loss of communication once the descent has begun, the helper locomotive engineer and the head-end engineer shall act to stop the train if the train has reached a predetermined rate of speed that indicates the need for emergency braking.

(D) The brake pipe of the helper locomotive shall be connected and cut into the train line and tested to ensure operation.

(ii) Use of an occupied caboose at the end of the train with a tested, functioning brake valve capable of initiating an emergency brake application from the caboose. This alternative may be used only if the train service employee in the caboose and the engineer on the head end of the train establish and maintain two-way voice radio communication and respond appropriately to the loss of such communication in the same manner as prescribed for helper locomotives in paragraph (g)(1)(i).

(iii) Use of a radio-controlled locomotive at the rear of the train under continuous control of the engineer in the head end by means of telemetry, but only if such radio-controlled locomotive is capable of initiating an emergency application on command from the lead (controlling) locomotive.

(2) [Reserved]

(h) *En route failure of device on a passenger train.* (1) A passenger train required to be equipped with a two-way end-of-train device that develops an en route failure of the device (as explained in paragraph (g) of this section) shall not operate over a section of track with an average grade of two percent or greater over a distance of two continuous miles until an operable two-way end-of-train device is installed on the train or an alternative method of initiating an emergency brake application from the rear of the train is achieved.

(2) Except as provided in paragraph (h)(1) of this section, a passenger train required to be equipped with a two-way end-of-train device that develops an en route failure of the device (as explained in paragraph (g) of this section) shall be operated in accordance with the following:

(i) A member of the train crew shall be immediately positioned in the car which contains the rearmost readily accessible emergency brake valve on the train and shall be equipped with an operable two-way radio that communicates with the locomotive engineer; and

(ii) The locomotive engineer shall periodically make running tests of the train's air brakes until the failure is corrected; and

(3) Each en route failure shall be corrected at the next location where the necessary repairs can be conducted or at the next location where a required brake test is to be performed, whichever is reached first.

§ 232.409 Inspection and testing of end-of-train devices.

(a) After each installation of either the front or rear unit of an end-of-train device, or both, on a train and before the train departs, the railroad shall determine that the identification code entered into the front unit is identical to the unique identification code on the rear-of-train unit.

(b) After each installation of either the front or rear unit of an end-of-train device, or both, the functional capability of the device shall be determined, after charging the train, by comparing the quantitative value displayed on the front unit with the quantitative value displayed on the rear unit or on a properly calibrated air gauge. The end-of-train device shall not be used if the difference between the two readings exceeds three pounds per square inch.

(c) A two-way end-of-train device shall be tested at the initial terminal or other point of installation to ensure that the device is capable of initiating an emergency power brake application from the rear of the train. If this test is conducted by a person other than a member of the train crew, the locomotive engineer shall be notified in writing that a successful test was performed. The written notification shall include the date and time of the test, the location where the test was performed, and the name of person conducting the test.

(d) The telemetry equipment shall be tested for accuracy and calibrated if necessary according to the manufacturer's specifications and procedures at least every 365 days. This shall include testing radio frequencies and modulation of the device. The date and location of the last calibration or test as well as the name of the person performing the calibration or test shall be legibly displayed on a weather-resistant sticker or other marking device affixed to the outside of both the front unit and the rear unit. If the front unit is an integral part of the locomotive, then the information may be recorded on Form FRA F6180–49A.

Subpart F—Introduction of New Brake System Technology

§ 232.501 Scope.

(a) This subpart contains general requirements for introducing new brake system technologies. This subpart is intended to facilitate the introduction of new complete brake system technologies or major up-grades to existing systems which the current regulations do not adequately address (i.e., electronic brake systems). This subpart is not intended for use in the introduction of a new brake component or material.

§ 232.503 Process to introduce new brake system technology.

(a) Pursuant to the procedures contained in § 232.17, each railroad shall obtain special approval from the FRA Associate Administrator for Safety of a pre-revenue service acceptance testing plan, developed pursuant to § 232.505, for the new brake system technology, prior to implementing the plan.

(b) Each railroad shall complete a pre-revenue service demonstration of the new brake system technology in accordance with the approved plan, shall fulfill all of the other requirements prescribed in § 232.505, and shall obtain special approval from the FRA Associate Administrator for Safety under the procedures of § 232.17 prior to using such brake system technology in revenue service.

§ 232.505 Pre-revenue service acceptance testing plan.

(a) Except as provided in paragraph (f) of this section, before using a new brake system technology for the first time on

its system the operating railroad or railroads shall submit a pre-revenue service acceptance testing plan containing the information required by paragraph (e) of this section and obtain the approval of the FRA Associate Administrator for Safety, under the procedures specified in § 232.17.

(b) After receiving FRA approval of the pre-revenue service testing plan and before introducing the new brake system technology into revenue service, the operating railroad or railroads shall:

(1) Adopt and comply with such FRA-approved plan, including fully executing the tests required by the plan;

(2) Report to the FRA Associate Administrator for Safety the results of the pre-revenue service acceptance tests;

(3) Correct any safety deficiencies identified by FRA in the design of the equipment or in the inspection, testing, and maintenance procedures or, if safety deficiencies cannot be corrected by design changes, agree to comply with any operational limitations that may be imposed by the Associate Administrator for Safety on the revenue service operation of the equipment; and

(4) Obtain FRA approval to place the new brake system technology in revenue service.

(c) The operating railroad shall comply with any such operational limitations imposed by the Associate Administrator for Safety.

(d) The plan shall be made available to FRA for inspection and copying upon request.

(e) The plan shall include all of the following elements:

(1) An identification of any waivers of FRA or other Federal safety regulations required for the tests or for revenue service operation of the equipment.

(2) A clear statement of the test objectives. One of the principal test objectives shall be to demonstrate that the equipment meets the safety design and performance requirements specified in this part when operated in the environment in which it is to be used.

(3) A planned schedule for conducting the tests.

(4) A description of the railroad property or facilities to be used to conduct the tests.

(5) A detailed description of how the tests are to be conducted. This description shall include:

(i) An identification of the equipment to be tested;

(ii) The method by which the equipment is to be tested;

(iii) The criteria to be used to evaluate the equipment's performance; and

(iv) The means by which the test results are to be reported to FRA.

(6) A description of any special instrumentation to be used during the tests.

(7) A description of the information or data to be obtained.

(8) A description of how the information or data obtained is to be analyzed or used.

(9) A clear description of any criteria to be used as safety limits during the testing.

(10) A description of the criteria to be used to measure or determine the success or failure of the tests. If acceptance is to be based on extrapolation of less than full level testing results, the analysis to be done to justify the validity of the extrapolation shall be described.

(11) A description of any special safety precautions to be observed during the testing.

(12) A written set of standard operating procedures to be used to ensure that the testing is done safely.

(13) Quality control procedures to ensure that the inspection, testing, and maintenance procedures are followed.

(14) Criteria to be used for the revenue service operation of the equipment.

(15) A description of any testing of the equipment that has previously been performed.

(f) For brake system technologies that have previously been used in revenue service in the United States, the railroad shall test the equipment on its system, prior to placing it in revenue service, to ensure the compatibility of the equipment with the operating system (track, signals, etc.) of the railroad. A description of such testing shall be retained by the railroad and made available to FRA for inspection and copying upon request.

Appendix A—Schedule of Civil Penalties [Reserved]

Issued in Washington, D.C., on August 27, 1998.

Jolene M. Molitoris,

Federal Railroad Administrator.

[FR Doc. 98–23645 Filed 9–8–98; 8:45 am]

BILLING CODE 4910–62–P